



GOVT OF KARNATAKA  
BANGALORE URBAN ZILLA PANCHAYATH  
DEPARTMENT OF SCHOOL EDUCATION

# UTTARA UNNATI-2

## SCIENCE

HANDBOOK OF PRACTICE PAPERS

PREPARED FOR THE QUALITATIVE

IMPROVEMENT OF SSLC EXAM-2024

RESULTS

**ENGLISH MEDIUM**

ALONG WITH MODEL ANSWERS



OFFICE OF THE  
**DEPUTY DIRECTOR OF PUBLIC INSTRUCTION**  
BANGALORE NORTH DIST. K G ROAD, BANGALORE



ಮುಖ್ಯ ಕಾರ್ಯನಿರ್ವಹಣಾಧಿಕಾರಿಗಳ ಕಚೇರಿ  
ಎಸ್ ಕರಿಯಪ್ಪ ರಸ್ತೆ  
ಬನಶಂಕರಿ  
ಬೆಂಗಳೂರು ನಗರ ಜಿಲ್ಲಾ ಪಂಚಾಯತ್  
ಬೆಂಗಳೂರು


ಶ್ರೀ ಕಾಂತರಾಜು ಪಿ ಎಸ್ ಭಾ.ಆ.ಸೇ  
ಮುಖ್ಯ ಕಾರ್ಯನಿರ್ವಹಣಾಧಿಕಾರಿಗಳು

## :: ಅಭಿನಂದನಾ ನುಡಿ ::

ಶಾಲಾ ಶಿಕ್ಷಣವು ವಿದ್ಯಾರ್ಥಿಗಳ ಜೀವನದಲ್ಲಿ ಅತ್ಯಂತ ಮಹತ್ವದ ಘಟ್ಟವಾಗಿದ್ದು, ಅದರಲ್ಲೂ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ ಎನ್ನುವುದು ಅತ್ಯಂತ ಪ್ರಮುಖವಾದ ಮೈಲಿಗಲ್ಲಾಗಿದೆ. ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ ಪರೀಕ್ಷೆಯನ್ನು ವಿದ್ಯಾರ್ಥಿಗಳು ವಿಶ್ವಾಸಪೂರ್ವಕವಾಗಿ ಬರೆಯುವಂತಾಗಲೂ ಮತ್ತು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಈ ದೆಸೆಯಲ್ಲಿ ಸಿದ್ಧಗೊಳಿಸಲು ಅನುವಾಗುವಂತೆ ಬೆಂಗಳೂರು ಉತ್ತರ ಶೈಕ್ಷಣಿಕ ಜಿಲ್ಲೆಯ ಉಪನಿರ್ದೇಶಕರ ಕಚೇರಿಯಿಂದ ಉತ್ತರ ಉನ್ನತಿ-2 ಎನ್ನುವ ಅಭ್ಯಾಸ ಪತ್ರಿಕೆಗಳ ಕೈಪಿಡಿಯನ್ನು ಮಾದರಿ ಉತ್ತರಗಳ ಸಮೇತ ನೀಡುತ್ತಿರುವುದು ಹರ್ಷದಾಯಕ ವಿಷಯವಾಗಿದೆ. ಪರೀಕ್ಷೆಗೆ ಉಳಿಕೆ ಇರುವ ದಿನಗಳಲ್ಲಿ ವಿದ್ಯಾರ್ಥಿಗಳು ಮತ್ತು ಶಿಕ್ಷಕರು ಸದರಿ ಕೈಪಿಡಿಯನ್ನು ಆಧರಿಸಿ ತಮ್ಮ ಹಂತದಲ್ಲಿ ಕ್ರಿಯಾಯೋಜನೆ ರಚಿಸಿಕೊಂಡು ಸದರಿ ಹೊತ್ತಿಗೆಯನ್ನು ಪರಿಣಾಮಕಾರಿ ಬಳಸಿಕೊಂಡು ಉತ್ತಮ ಫಲಿತಾಂಶ ಪಡೆಯಲು ಸಹಕಾರಿಯಾಗಲೀ ಎಂದು ಆಶಿಸುತ್ತಾ, ವಿದ್ಯಾರ್ಥಿಗಳ ಫಲಿತಾಂಶವು ಕೇವಲ ವಿದ್ಯಾರ್ಥಿಗೆ ಸಂಬಂಧಿಸಿದ ಫಲಿತಾಂಶವಾಗಿರದೇ, ಬೆಂಗಳೂರು ನಗರ ಜಿಲ್ಲೆಯ ಫಲಿತಾಂಶವೂ ಆಗಿರುವುದರಿಂದ ಜಿಲ್ಲೆಯ ಫಲಿತಾಂಶವನ್ನು ಪರಿಮಾಣಾತ್ಮಕವಾಗಿ ಮತ್ತು ಗುಣಾತ್ಮಕವಾಗಿ ಹೆಚ್ಚಿಸುವ ನಿಟ್ಟಿನಲ್ಲಿ ಈ ಪುಸ್ತಿಕೆಯು ದಾರಿದೀಪವಾಗಲೀ ಎಂದು ಹಾರೈಸುತ್ತಾ, ಈ ಹೊತ್ತಿಗೆಯನ್ನು ಹೊರತರುವಲ್ಲಿ ಶ್ರಮಿಸಿದ ಎಲ್ಲಾ ಅಧಿಕಾರಿಗಳು ಮತ್ತು ಸಂಪನ್ಮೂಲ ಶಿಕ್ಷಕರಿಗೆ ತುಂಬು ಹೃದಯದ ಅಭಿನಂದನೆಗಳು.

01.01.2024

ಬೆಂಗಳೂರು

  
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## ಮುನ್ನುಡಿ

ಶಿಕ್ಷಣವು ವಿದ್ಯಾರ್ಥಿಯ ವ್ಯಕ್ತಿತ್ವ ಬೆಳವಣಿಗೆಯಲ್ಲಿ ತನ್ನದೇ ಆದ ಮಹತ್ವವನ್ನು ಹೊಂದಿದೆ. ಅದರಲ್ಲೂ ಮಾಧ್ಯಮಿಕ ಶಿಕ್ಷಣವೂ ವಿದ್ಯಾರ್ಥಿಯ ಮುಂದಿನ ಭವಿಷ್ಯದ ತಳಪಾಯವಾಗಿದ್ದು, ರಾಷ್ಟ್ರದ ಉತ್ತಮ ನಾಗರಿಕ ಪ್ರಜೆಯನ್ನಾಗಿಸುವಲ್ಲಿ ಮಹತ್ವಮ ಘಟ್ಟವಾಗಿದೆ. ಕರ್ನಾಟಕ ಶಿಕ್ಷಣ ಸಂರಚನೆಯ ವ್ಯವಸ್ಥೆಯಲ್ಲಿ ಮಾಧ್ಯಮಿಕ ಶಿಕ್ಷಣದ ಮಹತ್ತರ ಘಟ್ಟವೆಂದೇ ಪರಿಗಣಿತವಾಗಿರುವ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ ವಿದ್ಯಾರ್ಥಿಗಳು ಮುಂದಿನ ಶೈಕ್ಷಣಿಕ ಆಯ್ಕೆ ಮತ್ತು ವೃತ್ತಿ ಜೀವನ ನಿರ್ಧಾರದ ಕೈಗೊಳ್ಳುವ ಪ್ರಥಮತಃ ಹಂತವಾಗಿದ್ದು, ಈ ತರಗತಿಯ ಫಲಿತಾಂಶವೂ ಅತ್ಯಂತ ಮಹತ್ತರವಾಗಿರುತ್ತದೆ.

ಪ್ರತೀ ವರ್ಷ ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯ ನಿರ್ಣಯ ಮಂಡಳಿಯಿಂದ ನಡೆಸಲ್ಪಡುವ ಹತ್ತನೇ ತರಗತಿಯ ಪರೀಕ್ಷೆಗೆ ಬೆಂಗಳೂರು ಉತ್ತರ ಶೈಕ್ಷಣಿಕ ಜಿಲ್ಲೆಯಿಂದ ಪ್ರಸಕ್ತ ವರ್ಷ 44378 ಶಾಲಾ ವಿದ್ಯಾರ್ಥಿಗಳು ಪರೀಕ್ಷೆಗೆ ಹಾಜರಾಗುತ್ತಿದ್ದು, ಈ ವಿದ್ಯಾರ್ಥಿಗಳ ಫಲಿತಾಂಶವನ್ನು ಗುಣಾತ್ಮಕವಾಗಿ ಹೆಚ್ಚಿಸುವ ನಿಟ್ಟಿನಲ್ಲಿ ಶಾಲಾ ಶಿಕ್ಷಕರಿಂದ ಮೊದಲುಗೊಂಡು, ಮುಖ್ಯ ಶಿಕ್ಷಕರು ಅಲ್ಲದೇ ತಾಲ್ಲೂಕು ಹಂತ, ಜಿಲ್ಲಾ ಹಂತ, ರಾಜ್ಯ ಹಂತದ ಎಲ್ಲಾ ಅಧಿಕಾರಿಗಳು ವಿವಿಧ ಕಾರ್ಯತಂತ್ರಗಳ ಮುಖೇನ ಪ್ರಯತ್ನಿಸುತ್ತಲೇ ಇದ್ದಾರೆ. ಈ ನಿಟ್ಟಿನಲ್ಲಿ ನಮ್ಮ ಕಚೇರಿಯಿಂದಲೂ 22 ಮೇ 2023 ರಂದು ಸರ್ಕಾರಿ ಮತ್ತು ಅನುದಾನಿತ ಪ್ರೌಢಶಾಲಾ ಮುಖ್ಯ ಶಿಕ್ಷಕರ ಸಭೆ ಕರೆದು ಪ್ರಸಕ್ತ ವರ್ಷದ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ ಫಲಿತಾಂಶವನ್ನು ಗುಣಾತ್ಮಕವಾಗಿ ಹೆಚ್ಚಿಸುವ ನಿಟ್ಟಿನಲ್ಲಿ ಕ್ರಿಯಾ ಯೋಜನೆಯನ್ನು ರಚಿಸಿ, ವಿವಿಧ ಕಾರ್ಯಚಟುವಟಿಕೆಗಳ ಮೂಲಕ ಶಿಕ್ಷಕರು ಮತ್ತು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಮುಟ್ಟುವಂತಹ ಕೆಲಸವನ್ನು ಜೂನ್ 2023ರಿಂದಲೂ ಮಾಡುತ್ತಲೇ ಬರುತ್ತಿದೆ.

ಈ ಕಾರ್ಯಚಟುವಟಿಕೆಯ ಒಂದು ಭಾಗವಾಗಿ “ಉತ್ತರ ಉನ್ನತಿ-2” ಎಂಬ ಮಾದರಿ ಉತ್ತರಗಳನ್ನು ಒಳಗೊಂಡ ಅಭ್ಯಾಸ ಪತ್ರಿಕೆಗಳ ಸಂಪನ್ಮೂಲ ಸಾಹಿತ್ಯವನ್ನು ರಚಿಸಿ, ಪ್ರಸ್ತುತ ಶಿಕ್ಷಕರಿಗೆ ನೀಡುತ್ತಿದ್ದೇವೆ. ಈ ಸಂಪನ್ಮೂಲ ಸಾಹಿತ್ಯವನ್ನು ಗುಣಾತ್ಮಕ ಫಲಿತಾಂಶದ ಒಂದು ಕಾರ್ಯತಂತ್ರವಾಗಿ ಹೇಗೆ ಬಳಕೆ ಮಾಡಬೇಕೆಂದು ವಿಷಯ ಪರಿವೀಕ್ಷಕರು ಮತ್ತು ವಿಷಯವಾರು ಸಂಪನ್ಮೂಲ ವ್ಯಕ್ತಿಗಳ ಮುಖೇನ ಮಾರ್ಗದರ್ಶನ ಮಾಡಿದ್ದು, ಇದು ಈ ಶೈಕ್ಷಣಿಕ ವರ್ಷದ ಬೆಂಗಳೂರು ಉತ್ತರ ಜಿಲ್ಲೆಯ ಫಲಿತಾಂಶವನ್ನು ಹೆಚ್ಚಿಸುವಲ್ಲಿ ಸಹಕಾರಿಯಾಗುವುದೆಂಬ ಆಶಯದೊಂದಿಗೆ ಈ ಕೈಪಿಡಿಯನ್ನು ಶಿಕ್ಷಕರ ಮತ್ತು ವಿದ್ಯಾರ್ಥಿಗಳ ಕೈಗಿಡಲಾಗುತ್ತಿದೆ. ಇದರ ಸದುಪಯೋಗವನ್ನು ಜಿಲ್ಲೆಯ ಎಲ್ಲಾ ವಿದ್ಯಾರ್ಥಿಗಳು, ಶಿಕ್ಷಕರು ಪಡೆದು, ಉತ್ತಮ ಫಲಿತಾಂಶಕ್ಕಾಗಿ ಶುಭ ಹಾರೈಸುತ್ತೇನೆ.

01.01.2024

ಬೆಂಗಳೂರು

ರಮೇಶ್ ವಿ

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ಶಿಕ್ಷಣಾಧಿಕಾರಿ

## ಶುಭ ಹಾರೈಕೆ

ಶಿಕ್ಷಣವು ಜ್ಞಾನವನ್ನು ಕಟ್ಟಿಕೊಳ್ಳುವ, ಜ್ಞಾನವನ್ನು ಸಂರಚಿಸಿಕೊಳ್ಳುವ ಹಾಗೂ ಜ್ಞಾನಾನ್ವೇಷಣೆಯತ್ತ ನಮ್ಮನ್ನು ಪ್ರೇರೇಪಿಸುವ ಒಂದು ಅದ್ಭುತ ಪ್ರಕ್ರಿಯೆ. ಬೋಧನೆ, ಕಲಿಕೆ, ಕಲಿಕೆಯ ದೃಢೀಕರಣ ಹಾಗೂ ಮೌಲ್ಯಮಾಪನ ಕ್ರಿಯೆಗಳು ಈ ಪ್ರಕ್ರಿಯೆಯ ಪ್ರಮುಖ ಭಾಗಗಳಾಗಿವೆ. ಮೌಲ್ಯಮಾಪನವು ವಿದ್ಯಾರ್ಥಿಗಳ ಗುಣಾತ್ಮಕ ಕಲಿಕೆಯನ್ನು ಹಾಗೂ ಕಲಿಕಾಫಲಗಳನ್ನು ಒರೆಹಚ್ಚುವ ಒಂದು ಸಾಧನವಾಗಿದೆ. ಈ ಮೌಲ್ಯಮಾಪನ ಪ್ರಕ್ರಿಯೆಯನ್ನು ಸದೃಢಗೊಳಿಸುವ ಹಿನ್ನೆಲೆಯಲ್ಲಿ ಹಾಗೂ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು 2023-24ನೇ ಸಾಲಿನ ಪರೀಕ್ಷೆಗಾಗಿ ಸಿದ್ಧಗೊಳಿಸುವ ನಿಟ್ಟಿನಲ್ಲಿ ಬೆಂಗಳೂರು ಉತ್ತರ ಜಿಲ್ಲೆಯಿಂದ ಅಭ್ಯಾಸ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಗಳನ್ನು ಒಳಗೊಂಡಿರುವ "ಉತ್ತರ ಉನ್ನತಿ-2" ಎಂಬ ಕೈಪಿಡಿಯನ್ನು ಹೊರತರಲಾಗುತ್ತಿದೆ. 2023-24ನೇ ಸಾಲಿನ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ ಫಲಿತಾಂಶ ಸುಧಾರಣೆಗಾಗಿ ಹೊರತರುತ್ತಿರುವ ಈ ಆವೃತ್ತಿಯು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಪ್ರಶ್ನೆಗಳನ್ನು ಅರ್ಥೈಸಿಕೊಳ್ಳುವ, ವಿಶ್ಲೇಷಿಸುವ ಹಾಗೂ ಸೂಕ್ತ ರೀತಿಯಲ್ಲಿ ಉತ್ತರಿಸುವ ಪ್ರಕ್ರಿಯೆಯನ್ನು ಸದೃಢಗೊಳಿಸುವತ್ತ ಬಹಳ ಪರಿಣಾಮಕಾರಿಯಾಗಿದೆ. ಈ "ಉತ್ತರ ಉನ್ನತಿ-2" ನೂತನ ಆವೃತ್ತಿಯು 2023-24ನೇ ಸಾಲಿನ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಉತ್ತಮ ಕಲಿಕಾ ಸಾಮಗ್ರಿಯಾಗಿ ಉಪಯೋಗವಾಗಲಿ ಎಂಬುವುದು ನಮ್ಮ ಆಶಯ. ಈ ಕೈಪಿಡಿಯನ್ನು ಹೊರತರುವಲ್ಲಿ ತಮ್ಮ ಅಮೂಲ್ಯ ಸಲಹೆ ಹಾಗೂ ಮಾರ್ಗದರ್ಶನವನ್ನು ನೀಡಿದ ಉಪನಿರ್ದೇಶಕರು (ಆಡಳಿತ), ಬೆಂಗಳೂರು ಉತ್ತರ ಜಿಲ್ಲೆ, ಇವರಿಗೂ ಹಾಗೂ ಜಿಲ್ಲಾ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ ನೋಡಲ್ ಅಧಿಕಾರಿಗಳಿಗೂ ಮತ್ತು ಈ ಕಾರ್ಯಕ್ಕೆ ಶ್ರಮಿಸಿದ ಎಲ್ಲಾ ಸಂಪನ್ಮೂಲ ವ್ಯಕ್ತಿಗಳು, ವಿಷಯ ಪರಿವೀಕ್ಷಕರು ಹಾಗೂ ಅಧಿಕಾರಿ ವೃಂದದವರಿಗೂ ಹೃತ್ಪೂರ್ವಕ ಅಭಿನಂದನೆಗಳು. 2023-24ನೇ ಸಾಲಿಗೆ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ ಪರೀಕ್ಷೆಗೆ ಹಾಜರಾಗುತ್ತಿರುವ ಎಲ್ಲಾ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೂ ಶುಭ ಹಾರೈಸುತ್ತಾ ಜಿಲ್ಲೆಯ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ ಫಲಿತಾಂಶವು ಉತ್ತಮಕ್ಕೆ ಏರಲೆಂದು ಮನದುಂಬಿ ಆಶಿಸುತ್ತೇನೆ.

01.01.2024

ಬೆಂಗಳೂರು

ಪಂಕಜ ಜಿ ಸಿ

ಶಿಕ್ಷಣಾಧಿಕಾರಿ



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### ಕೈಪಿಡಿಯ ಕುರಿತು

2024 ನೇ ಸಾಲಿನ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ ಪರೀಕ್ಷೆಯನ್ನು ನಡೆಸುವ ವಿಧಾನದಲ್ಲಿ ಹಲವಾರು ಬದಲಾವಣೆಗಳನ್ನು ತರಲು ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯ ನಿರ್ಣಯ ಮಂಡಳಿ ನಿರ್ಧರಿಸಿರುವುದು ತಮಗೆಲ್ಲಾ ತಿಳಿದಿರುವ ವಿಷಯವೇ ಆಗಿದೆ. ಈ ಬಗ್ಗೆ ಈಗಾಗಲೇ ನಡೆಸಿರುವ ಮುಖ್ಯ ಶಿಕ್ಷಕರ ಮತ್ತು ಶಿಕ್ಷಕರ ಸಭೆಗಳಲ್ಲಿ ವಿಸ್ತೃತವಾಗಿ ತಿಳಿಯಪಡಿಸಿದೆ. ಈ ಬದಲಾವಣೆಗಳೊಂದಿಗೆ ಶಿಕ್ಷಕರನ್ನು ಶೈಕ್ಷಣಿಕವಾಗಿ ಬಲಪಡಿಸಲು ಮತ್ತು ವಿದ್ಯಾರ್ಥಿಗಳು ಆತ್ಮವಿಶ್ವಾಸದಿಂದ ಪರೀಕ್ಷೆಯನ್ನು ಬರೆಯುವಂತೆ ಮಾಡಲು ಪ್ರತಿ ವರ್ಷದಂತೆ ಈ ವರ್ಷವೂ 'ಉತ್ತರ ಉನ್ನತಿ-2' ಎಂಬ ಅಭ್ಯಾಸ ಪತ್ರಿಕೆಗಳ ಕೈಪಿಡಿಯನ್ನು ಹಲವಾರು ಬದಲಾವಣೆಗಳೊಂದಿಗೆ ತಮ್ಮ ಮುಂದಿಡಲು ನಾವು ಹರ್ಷಿಸುತ್ತೇವೆ. ಇದು 'ಉತ್ತರ ಉತ್ತುಂಗ'ದ ಹೊಸ ಶೀರ್ಷಿಕೆಯ ಹೊಸ ಆವೃತ್ತಿ ಎಂಬುದನ್ನು ತಿಳಿಸಲು ಋಷಿ ಎನಿಸುತ್ತದೆ.

ಹಿಂದಿನ ಕರ್ನಾಟಕ ಪ್ರೌಢ ಶಿಕ್ಷಣ ಪರೀಕ್ಷಾ ಮಂಡಳಿ, ಪ್ರಸ್ತುತ ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯ ನಿರ್ಣಯ ಮಂಡಳಿಯು 2019-20 ರಲ್ಲಿ ಪ್ರಕಟಿಸಿರುವ "ದೀವಿಗೆ" ಎಂಬ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ ವಿನ್ಯಾಸ ಕೈಪಿಡಿ, ಮಂಡಳಿಯು ಈ ಹಿಂದಿನ ವರ್ಷಗಳಲ್ಲಿ ಪ್ರಕಟಿಸಿರುವ ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಗಳು ಮತ್ತು ಸದರಿ ವರ್ಷ ಮೌಲ್ಯಮಾಪನಕ್ಕೆ ಪರಿಗಣಿಸಿರುವ ಪರಿಷ್ಕೃತ ಅಧ್ಯಾಯಗಳ ಆಧಾರದ ಮೇಲೆ ಈ ಅಭ್ಯಾಸ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಗಳನ್ನು ಸಂಪನ್ಮೂಲ ಶಿಕ್ಷಕರ ತಂಡದಿಂದ ರಚಿಸಲಾಗಿದ್ದು, ಸದರಿ ಸಾಹಿತ್ಯವು 10 ಅಭ್ಯಾಸ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಗಳನ್ನು ಒಳಗೊಂಡಿದೆ. ವಿಶೇಷವಾಗಿ ಈ ವರ್ಷದ ನೂತನ ಆವೃತ್ತಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯ ನಿರ್ಣಯ ಮಂಡಳಿಯು ಪ್ರಕಟಿಸಿರುವ ಮಾದರಿ ಉತ್ತರಗಳ ಮಾದರಿಯಲ್ಲಿ ಪ್ರತಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಗಳಿಗೂ ಉತ್ತರ ಕೀಲಿಯನ್ನು ನೀಡಲಾಗಿದೆ. ಇದು ವಿದ್ಯಾರ್ಥಿಗಳ ಸ್ವ ಮೌಲ್ಯಮಾಪನಕ್ಕೆ ಹೆಚ್ಚು ಅನುಕೂಲಕರವಾಗಿದೆ.

ಸದರಿ ಅಭ್ಯಾಸ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಗಳನ್ನು ವಿವಿಧ ಕಾರ್ಯತಂತ್ರಗಳನ್ನು ಬಳಕೆ ಮಾಡಿ ವಿದ್ಯಾರ್ಥಿಗೆ ಅಭ್ಯಾಸ ಮಾಡಿಸಬಹುದಾಗಿದ್ದು, ಪ್ರತಿ ಅಭ್ಯಾಸ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯ ಬಳಕೆಯ ನಂತರ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಹಿಮ್ಮಾಹಿತಿ ನೀಡಿ ಫಲಿತಾಂಶ ಸುಧಾರಣೆಗೆ ಶ್ರಮಿಸುವುದು.

ಸದರಿ "ಉತ್ತರ ಉನ್ನತಿ-2" ನೂತನ ಕೈಪಿಡಿಯು ಶಿಕ್ಷಕರಿಗೆ ಮತ್ತು ವಿದ್ಯಾರ್ಥಿಗಳ ಅಭ್ಯಾಸಕ್ಕಾಗಿ ಪ್ರಕಟಿಸುತ್ತಿರುವ ಅಭ್ಯಾಸ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಗಳಾಗಿದ್ದು, ಈ ಸಾಹಿತ್ಯವನ್ನು ತರಲು ಸೂಕ್ತ ಮಾರ್ಗದರ್ಶನ ನೀಡಿದ ನಮ್ಮ ಜಿಲ್ಲೆಯ ಶೈಕ್ಷಣಿಕ ನಾಯಕರು ಆದಂತಹ ಶ್ರೀ ಲೋಹಿತೇಶ್ವರ ರೆಡ್ಡಿ ಕೆ.ಪಿ ರವರು, ಉಪನಿರ್ದೇಶಕರು (ಆಡಳಿತ)ರವರಿಗೆ ತುಂಬು ಹೃದಯದ ಧನ್ಯವಾದಗಳನ್ನು ಅರ್ಪಿಸುತ್ತೇನೆ. ಅದರಂತೆ ಈ ಕಾರ್ಯದ ಪ್ರತಿ ಹಂತದಲ್ಲೂ ಅಗತ್ಯ ಸಲಹೆ, ಸಹಕಾರ ನೀಡಿ ಈ ಸುಂದರ ಹೊತ್ತಿಗೆ ಹೊರತರಲು ಪರಿಶ್ರಮಿಸಿದ ನಮ್ಮ ಕಚೇರಿ ಶಿಕ್ಷಣಾಧಿಕಾರಿಗಳು ಹಾಗೂ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ ನೋಡಲ್ ಅಧಿಕಾರಿಗಳು ಆದಂತಹ ಶ್ರೀ ರಮೇಶ ವಿ ರವರಿಗೂ, ಮತ್ತೊಬ್ಬ ಶಿಕ್ಷಣಾಧಿಕಾರಿಗಳಾದ ಪಂಕಜ ಜಿ ಸಿ ರವರಿಗೂ ಧನ್ಯವಾದಗಳು. ಇನ್ನೂ ನಮ್ಮ ಈ ಪರಿಶ್ರಮದಲ್ಲಿ ಜೊತೆಯಲ್ಲಿದ್ದು, ಸಹಕರಿಸಿದ ನಮ್ಮ ಕಚೇರಿಯ ಎಲ್ಲಾ ವಿಷಯ ಪರಿವೀಕ್ಷಕರಿಗೂ ಮುಖ್ಯವಾಗಿ ಕಳೆದ ಐದು ವರ್ಷಗಳಿಂದ ನಮ್ಮ ಕಚೇರಿಯ ಎಲ್ಲಾ ಶೈಕ್ಷಣಿಕ ಕಾರ್ಯಕ್ರಮಗಳಲ್ಲಿ ಕೈ ಜೋಡಿಸುತ್ತಿರುವ ಎಲ್ಲಾ ವಿಷಯ ಸಂಪನ್ಮೂಲ ಶಿಕ್ಷಕರಿಗೂ ಧನ್ಯವಾದಗಳನ್ನು ಅರ್ಪಿಸುತ್ತಿದ್ದೇನೆ. ಈ ಸಾಹಿತ್ಯವನ್ನು ತಮ್ಮ ಉಪಯೋಗಕ್ಕೆ ನೀಡಲು ಆನಂದವೆನಿಸುತ್ತದೆ.

ವಂದನೆಗಳೊಂದಿಗೆ,

01.01.2024

ಬೆಂಗಳೂರು

ವಿಜಯಲಕ್ಷ್ಮಿ ಎನ್ ಪಿ

## **RESOURCE TEACHERS' TEAM**

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4. NAGESH S, AM, NKSHS, N-2
5. KAVITHA M.C, AM, GHS, AGRAHARA LAYOUT, N-4
6. SHIVAJYOTHI, AM, KPS, LINK ROAD, SHESHADRIPURAM, N-2
7. Dr SANDHYA D.N, AM, GHS, T.DASARAHALLI, N-4
8. VAJRESHWARI S.S, AM, GHS, JOOGANAHALLI, N-1
9. JYOTHI M.S, AM, GHS, SARVAJNANAGAR, N-3
10. RASHMI M, AM, KPS, LINK ROAD, SHESHADRIPURAM, N-2
11. TARAMANI G, AM, KPS, 13<sup>TH</sup> CROSS, MALLESHWARAM, N-2
12. RESHMA KHANUM, AM, GJC, J.C NAGAR, N-3
13. RASHMI.P, AM, KPS, LINK ROAD, SHESHADRIPURAM, N-2
14. SHYAMALA S, AM, GHS, NELAGADARANAHALI, N-1
15. SINDHU D.S, KPS, BAGALURU, N-4
16. ARUN MEENAKSHI, AM, GHS, YALAHANKA UPANAGARA, N-4
17. SHAIK MALLIK, AM, ELEGANT INTERNATIONAL SCHOOL, N-3

## ವಿಷಯ : ವಿಜ್ಞಾನ

ಪ್ರಮುಖ ವಿಷಯಾಂಶ ಆಧಾರಿತ Theme based) ಅಂಕಗಳ ನಿಗದಿ

| ಪ್ರಮುಖ ವಿಷಯಗಳು<br>( Themes)                  | ನಿಗದಿಪಡಿಸಿದ ಅಧ್ಯಾಯಗಳು   | ನಿಗದಿಪಡಿಸಿದ ಒಟ್ಟು ಅಂಕಗಳು |
|--|---|--------------------------|
| 1. ನಿತ್ಯ ಜೀವನದಲ್ಲಿ<br>ವಸ್ತುಗಳು               | 1. ರಾಸಾಯನಿಕ ಕ್ರಿಯೆಗಳು<br>ಮತ್ತು ಸಮೀಕರಣಗಳು.<br>2. ಆಮ್ಲಗಳು ಪ್ರತ್ಯಾಮ್ಲಗಳು<br>ಮತ್ತು ಲವಣಗಳು<br>3. ಲೋಹಗಳು ಮತ್ತು<br>ಅಲೋಹಗಳು<br>4. ಕಾರ್ಬನ್ ಮತ್ತು ಅದರ<br>ಸಂಯುಕ್ತಗಳು<br>5. ಧಾತುಗಳ ಆವರ್ತನೀಯ<br>ವರ್ಗೀಕರಣ | <b>25</b>                |
| 2. ಜೀವಿಗಳ ಪ್ರಪಂಚ                             | 6. ಜೀವ ಕ್ರಿಯೆಗಳು<br>7. ನಿಯಂತ್ರಣ ಮತ್ತು<br>ಸಹಭಾಗಿತ್ವ<br>8. ಜೀವಿಗಳು ಹೇಗೆ<br>ಸಂತಾನೋತ್ಪತ್ತಿ<br>ನಡೆಸುತ್ತವೆ?<br>9. ಆನುವಂಶಯತೆ ಮತ್ತು<br>ಜೀವ ವಿಕಾಸ  | <b>22</b>                |
| 3. ನೈಸರ್ಗಿಕ<br>ವಿದ್ಯಮಾನಗಳು                   | 10. ಬೆಳಕು-ಪ್ರತಿಫಲನ ಮತ್ತು<br>ವಕ್ರೀಭವನ<br>11. ಮಾನವನ ಕಣ್ಣು ಮತ್ತು<br>ವರ್ಣಮಯ ಜಗತ್ತು  | <b>13</b>                |
| 4. ವಸ್ತುಗಳು ಹೇಗೆ<br>ಕಾರ್ಯ<br>ನಿರ್ವಹಿಸುತ್ತವೆ? | 12. ವಿದ್ಯುಚ್ಛಕ್ತಿ<br>13. ವಿದ್ಯುತ್ ಶಕ್ತಿಯ<br>ಕಾಂತೀಯ<br>ಪರಿಣಾಮಗಳು   | <b>12</b>                |
| 5. ಪರಿಸರ/ನಿಸರ್ಗ                              | 14. ಶಕ್ತಿಯ ಆಕರಗಳು<br>15. ನಮ್ಮ ಪರಿಸರ<br>16. ನೈಸರ್ಗಿಕ<br>ಸಂಪನ್ಮೂಲಗಳ ಸುಸ್ಥಿರ<br>ನಿರ್ವಹಣೆ   | <b>08</b>                |
| <b>ಒಟ್ಟು</b>                                 | <b>ಭೌತ ವಿಜ್ಞಾನ : 28</b>   |                          |



|  |                                      |           |
|--|--------------------------------------|-----------|
|  | ರಸಾಯನ ವಿಜ್ಞಾನ: 25<br>ಜೀವವಿಜ್ಞಾನ : 27 | <b>80</b> |
|--|--------------------------------------|-----------|

ವಾರ್ಷಿಕ ಪರೀಕ್ಷೆಯ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ ಸ್ವರೂಪ:

| ಪ್ರಶ್ನೆಗಳ ಸ್ವರೂಪ  | ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ                               | ಅಂಕಗಳು                        |
|---|--|-------------------------------|
| ಬಹು ಅಂಶ ಆಯ್ಕೆ ಪ್ರಶ್ನೆಗಳು                                  | 8  | 8                             |
| ಅತಿ ಕಿರು ಉತ್ತರದ ಪ್ರಶ್ನೆಗಳು                                | 8  | 8                             |
| ಕಿರು ಉತ್ತರದ ಪ್ರಶ್ನೆಗಳು<br>(2 ಅಂಕಗಳಿಗೆ)                    | 8  | 16                            |
| ಧೀರ್ಘ ಉತ್ತರಗಳ ಪ್ರಶ್ನೆಗಳು<br>(3 ಅಂಕಗಳಿಗೆ)                  | 9  | 27                            |
| ಧೀರ್ಘ ಉತ್ತರಗಳ ಪ್ರಶ್ನೆಗಳು<br>(4 ಅಂಕಗಳಿಗೆ)                  | 4  | 16                            |
| ಧೀರ್ಘ ಉತ್ತರಗಳ ಪ್ರಶ್ನೆಗಳು<br>(5 ಅಂಕಗಳಿಗೆ)                  | 1  | 5                             |
| <b>ಒಟ್ಟು</b>  | <b>38</b>                                      | <b>80</b>                     |
| <b>(20 ಅಂಕಗಳಿಗೆ ಆಂತರಿಕ<br/>ಆಯ್ಕೆ ಪ್ರಶ್ನೆಗಳು ಇರುತ್ತವೆ)</b> | <b>4 ರೂಪನಾತ್ಮಕ<br/>ಮೌಲ್ಯಮಾಪನಗಳಿಂದ<br/>20×4</b> | <b>20</b><br><hr/> <b>100</b> |

## Model Question Paper - 01

### Part-A Physics

I. Four alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet

1\*4=4

- The correct statement among the following related to the concave lens is  
(A) converges the light rays (B) diverges the light rays  
(C) forms inverted image (D) forms real image.
- An electric bulb is rated 220 V and 100 W. When it is operated on 110 V, the power consumed will be –  
(a) 100 W (b) 75 W (c) 50 W (d) 25 W
- A positively-charged particle (alpha-particle) projected towards west is deflected towards north by a magnetic field. The direction of magnetic field is  
(a) towards south (b) towards east (c) downward (d) upward
- Which of the following is not an example of a bio-mass energy source?  
(a) wood (b) gobar-gas (c) nuclear energy (d) coal

II. Answer the following questions :

1\*2=2

- What is meant by power of accommodation of the eye?
- How is a voltmeter connected in the circuit to measure the potential difference between two points?

III. Answer the following questions:

2\*2=4

- Draw the diagram of a simple electric motor and label 'Split rings' ? **OR**  
What are the two methods of increasing magnetic field in a solenoid?
- Write any two limitations of producing electricity from wind energy.

IV. Answer the following.

3\*3=9

- State Joule's law of heating. Name any two devices that work on application of this law.  
b) State Ohms law.
- Draw ray diagram of image formation when the object is kept at  $2F_1$  of the convex lens. With the help of the ray diagram, mention the position and nature of the image formed.  
[  $F_1$  : Principal focus of the lens ] **OR**  
Draw ray diagram of image formed when object is kept between C and F of the concave mirror. With the help of ray diagram mention the position and nature of image formed.  
[ F : Principal focus of the mirror, C : Centre of curvature of mirror ]
- The far point of a myopic person is 80 cm in front of the eye. What is the nature and power of the lens required to correct the problem? What is cataract?

V. Answer the following:

4\*1=4

- a) Write any four uses of concave mirror.  
b) An object is placed at a distance of 15 cm on the principal axis in front of a concave lens with a focal length of 10 cm. Find the image distance. **OR**
- a) Convex mirror is commonly used as rearview mirror in vehicles. Why?  
b) An object is placed at a distance of 20 cm on the principal axis in front of a convex mirror with focal length of 30 cm. Find the image distance.

VI. Answer the following:

1\*5=5

- a. In domestic electric circuit electrical appliances are not connected in series. Why?  
b. A copper wire has diameter 0.5 mm and resistivity of  $1.6 \times 10^{-8} \Omega \text{ m}$ . What will be the length of this wire to make its resistance 10  $\Omega$ ? How much does the resistance change if the diameter is doubled?

### PART-B CHEMISTRY

**VII. Four alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet .**

**1\*2=2**

14. Which of the following pairs will give displacement reaction?

- a) NaCl solution and copper metal
- b) MgCl<sub>2</sub> solution and aluminium metal
- c) FeSO<sub>4</sub> solution and silver metal
- d) AgNO<sub>3</sub> solution and copper metal

15. 18<sup>th</sup> group elements are called

- a) Alkali metals
- b) Halogens
- c) Inert gases
- d) Alkaline earth metals

**VIII. Answer the following questions**

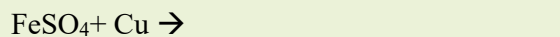
**1X4=4**

16. Name the functional group present in butanoic acid

17. What are redox reactions?

18.  $\text{Fe}_2\text{O}_3 + 2\text{Al} \rightarrow \text{Al}_2\text{O}_3 + 2\text{Fe}$ . Identify the type of chemical reaction.

19. Complete the following reaction:



**IX. Answer the following questions**

**2x3=6**

20. Draw the diagram showing the reaction of zinc granules with dilute sulphuric acid, and testing hydrogen gas by burning and label zinc granules and dil. sulphuric acid.

21 Write the electron dot structure for the formation of magnesium chloride. **OR**

8. What is corrosion? What are the conditions required for the corrosion of iron.

22. Draw a diagram of electrolytic refining of copper and label

- i) Anode mud
- ii) Electrolyte used

**X. Answer the following questions**

**3X3=9**

23. i) What is a decomposition reaction?

ii) Name different types of decomposition reactions and give one example for each.

24. A compound 'x' from sea water is used to manufacture compound 'y' which is bitter in taste and is used for softening hard water. When 'y' reacts with dil. HCl a colourless gas 'z' is evolved, which is a non-supporter of combustion. If 'z' is passed through a solution of 'y', 'w' is precipitated which is used as an antacid. Identify 'w', 'x', 'y', 'z'.

**OR**

We know that, metals and ionic compound in molten state or in aqueous solution conduct electricity. Is the conduction of electricity in the two process similar. Explain.

25. Give reasons

- i. Atomic size decreases as we move along the period.
- ii. Hydrogen is placed in first group.
- iii. F-block elements are placed at the bottom of the periodic table.

**XI. Answer the following questions**

**4x1=4**

26. Write the structural formulae for the following compounds

- i) Benzene ii) Butanone iii) Ethyne iv) Cyclohexane

**Part C -BIOLOGY**

**XII. Four alternatives are given for each of the following questions /incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet**

**1\*2=2**

27. In mitochondria the breakdown of pyruvate gives \_\_\_\_\_

- a)  $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{energy}$  b) Lactic acid + energy  
b)  $3\text{CO}_2 + 3\text{H}_2\text{O} + \text{energy}$  d) Lactic acid +  $\text{CO}_2 + \text{energy}$

28. The Aquatic food chain in the following is \_\_\_\_\_

- a) Phytoplankton's → zooplanktons → fish → Shark  
b) Grass → Insects → Snake → Hawk  
c) Tree → rabbit → Snake → Hawk  
d) Plants → sheep → Human beings

**XIII Answer the following.**

**1\*2=2**

29. Write the difference between phototropism and geotropism.

30. Mention any two major benefits of dams.

**XIV Answer the following questions:**

**3x2=6**

31. What changes you can make in your habits to become more environment friendly?

32. Draw a labeled diagram of excretory system and label the following.

- a) Ureter b) Urinary bladder

33. Can a wing of butterfly and the wing of a bat are homologous organs? Justify.

**XV Answer the following questions:**

**3x3=9**

34. Mention the events that occur during photosynthesis in plants. **OR**

Explain the stages of "double circulation" of the blood in humans.

35. Explain Mendel's observation when he crossed a homozygous tall(TT)

plant with Homozygous dwarf (tt) plant followed by self-cross. **OR**

How is Sex of a child determined in human beings?

36. What are the important functions of placenta?

**XVI. Answer the following question:**

**2x 4=8**

37. Draw a diagram of human brain and label the following.

- a) Cerebellum b) Mid-brain

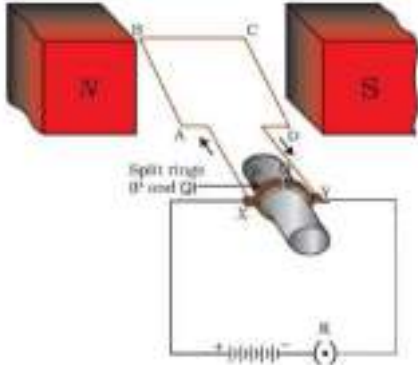
38. What is the cause of variation in asexually reproducing organisms?

An individual organism cannot pass the experiences acquired during its life time to the progenies of the next generation." Explain this concept with the help of an illustration.

**Model Question Paper – 01**

**KEY ANSWERS**

**PART – A PHYSICS**

| Qn . Nos | Value points   | Total |
|----------|--|-------|
| I.       | <p><b>Four alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.</b> <span style="float:right"><b>4×1=4</b></span></p>   |       |
| 1.       | (b) diverges the light rays  | 1     |
| 2.       | (d) 25 W   | 1     |
| 3.       | (d) upward   | 1     |
| 4.       | (c) nuclear energy   | 1     |
| II.      | <p><b>Answer the following questions:</b> <span style="float:right"><b>2×1=2</b></span></p>  |       |
| 5.       | The ability of human eye to see nearby and distant objects clearly by changing the focal length of the eye lens.   | 1     |
| 6.       | To measure the potential difference between two points, a voltmeter should be connected in parallel to the points.   | 1     |
| III.     | <p><b>Answer the following questions:</b> <span style="float:right"><b>2×2=4</b></span></p>  |       |
| 7.       | <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 20px;"> <p>Diagram 1½ + Labeling ½</p> </div> </div>  | 2     |
|          | OR   |       |
|          | <ul style="list-style-type: none"> <li>➤ By increasing the number of turns in the coil</li> <li>➤ By increasing the strength of the current</li> <li>➤ By using soft iron core as a core material</li> </ul>   |       |
|          | (Any two) 1+1  | 2     |
| 8.       | <ul style="list-style-type: none"> <li>➤ A wind mill requires wind of speed more than 15 km/h to generate electricity.</li> <li>➤ Setting up of wind energy farms is expensive.</li> <li>➤ Cannot be established in all places and requires more land.</li> </ul>  |       |
|          | (Any two) 1+1  | 2     |
| IV.      | <p><b>Answer the following:</b> <span style="float:right"><b>3×3=9</b></span></p>  |       |
| 9. a)    | <p>Joule’s law states that, the heat produced in a resistor is (i) directly proportional to the square of current for a given resistance, (ii) directly proportional to resistance for a given current and (iii) directly proportional to the time for which the current flows through the resistor.</p> |       |

| Qn . Nos | Value points | Total |
|----------|--------------|-------|
|----------|--------------|-------|

In other words, if current 'I' is passed through a conductor of resistance 'R' for time 't' then heat produced is,  $H=I^2Rt$ . 1  
 Electric heater, Electric iron, Filament lamp, Electric kettle, Electric cooker hob, Electric toaster, etc. (Any two) ½ + ½

b) Ohm's law states that, the current through a conductor between two points is directly proportional to the potential difference across the two points, provided its temperature remains the same.

In other words, if the potential difference across the two ends of a conductor is 'V' and the current through it is 'I' then ,  $V/I = \text{constant}$  or  $V/I = R$ . 1

10.

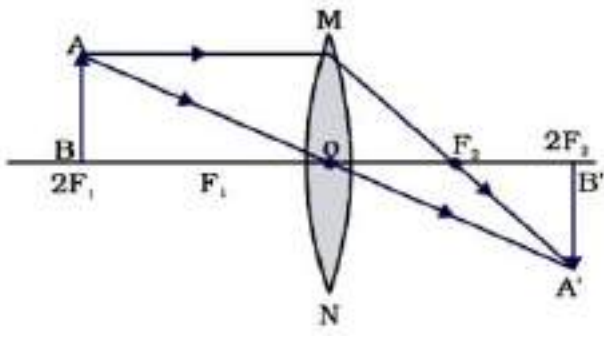


Diagram 2

Position of image: at  $2F_2$  1  
 Nature of image: real and inverted 1

OR

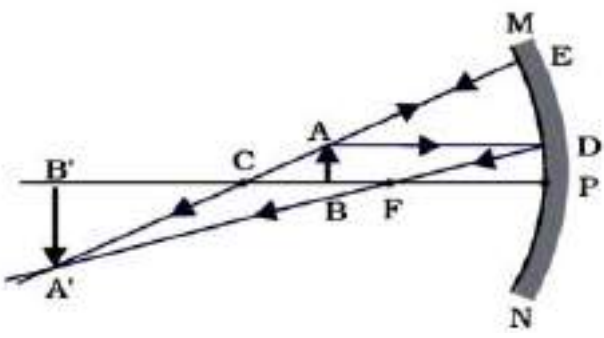


Diagram 2

Position of image: beyond C 1  
 Nature of image: real and inverted 1

11. Given, distance of far point  $x = 80$  cm. To view distant objects correctly, focal length of the corrective lens,  $f = -x = -80$ cm.

Power of the lens P (in meters) =  $(1/ -0.8) = -1.25$ D. 1

The lens is concave. 1

Crystalline lens of people at old age becomes milky and cloudy. This condition is called cataract. 1

3

3

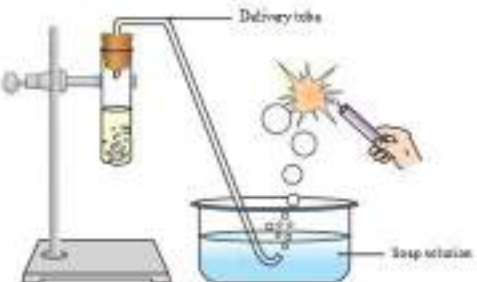
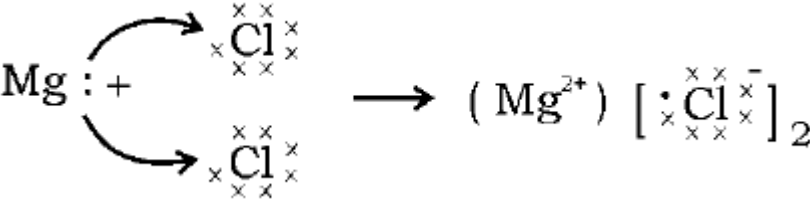
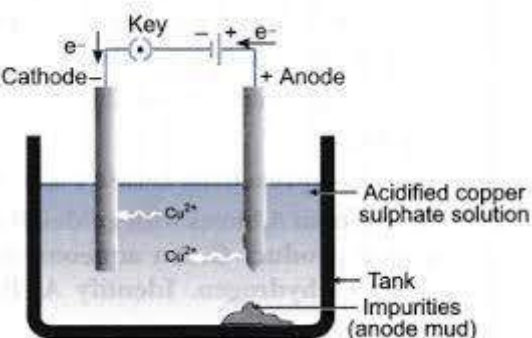
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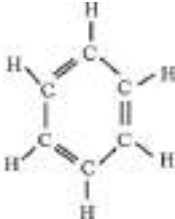
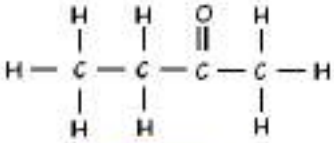
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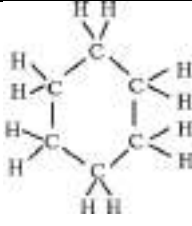
| Qn . Nos  | Value points | Total         |
|---|--------------|---------------|
| V. <b>Answer the following:</b>   | <b>1×4=4</b> |               |
| 12.a) Uses of Concave mirror:   |              |               |
| <ul style="list-style-type: none"> <li>➤ Used in Torches,</li> <li>➤ Used in Search-light,</li> <li>➤ Used in Vehicle headlights,</li> <li>➤ Used as Shaving mirrors,</li> <li>➤ Used in Solar furnace,</li> <li>➤ Dentist use to see large images of the teeth.</li> </ul> | (Any 4) 2    |               |
| b) Object distance, $u = - 15$ cm,  |              |               |
| Focal length of a concave lens, $f = - 10$ cm,  |              |               |
| Image distance, $v = ?$   |              | $\frac{1}{2}$ |
| According to lens formula,  |              |               |
| $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$   |              | $\frac{1}{2}$ |
| $\frac{1}{-10} = \frac{1}{v} - \frac{1}{-15}$   |              |               |
| $\frac{1}{-10} + \frac{1}{-15} = \frac{1}{v}$   |              | $\frac{1}{2}$ |
| $\frac{1}{v} = \frac{-3-2}{30}$   |              |               |
| $\frac{1}{v} = \frac{-5}{30}$   |              |               |
| $\therefore v = - 6$ cm   |              | $\frac{1}{2}$ |
| OR  |              |               |
| a) Convex mirrors always give an erect, diminished image. As they have a wider field of view thus enabling the vehicle driver to view much larger image.  |              | 2             |
| b) Object distance, $u = - 20$ cm,  |              |               |
| Focal length of a convex mirror, $f = + 30$ cm,   |              |               |
| Image distance, $v = ?$   |              | $\frac{1}{2}$ |
| According to lens formula,  |              |               |
| $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$   |              | $\frac{1}{2}$ |
| $\frac{1}{30} = \frac{1}{v} + \frac{1}{-20}$  |              |               |
| $\frac{1}{30} - \frac{1}{-20} = \frac{1}{v}$  |              | $\frac{1}{2}$ |
| $\frac{1}{v} = \frac{1}{30} + \frac{1}{20}$   |              |               |
| $\frac{1}{v} = \frac{2+3}{60}$  |              |               |

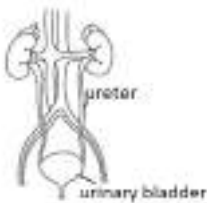




| Qn Nos      | Value points   | Total |
|-------------|--|-------|
| <b>VII</b>  |  |       |
| 14.         | d) AgNO <sub>3</sub> and Cu  | 1     |
| 15.         | c) Inert gases   | 1     |
| <b>VIII</b> |  |       |
| 16.         |  | 1     |
| 17.         | Carboxylic acid  | 1     |
| 18.         | The reactions in which both oxidation and reduction takes place simultaneously is called redox reaction.                                       | 1     |
| 19.         | Displacement reaction.   | 1     |
| 20.         | No reaction. Because Cu is less reactive than Fe   | 1     |
| <b>IX</b>   |  |       |
| 20.         |    | 2     |
|             | Diagram 2  |       |
| 21          | $Mg \rightarrow Mg^{2+} + 2e^{-}$ $2Cl + 2e^{-} \rightarrow Cl_2$  | 2     |
|             |    | 2     |
|             | <b>OR</b>  |       |
|             | The phenomenon in which metals are slowly eaten away by the reaction of air, water, chemicals present in the atmosphere is called corrosion. 1 | 2     |
|             | Conditions required for corrosion iron are oxygen and moisture 1   | 1     |
| 22          |   | 2     |

|         |   |   |
|---------|---|---|
| X<br>23 | <p>i) A reaction in which a single breaks down to form two or more products is called decomposition reaction <span style="float: right;">1</span></p> <p>ii) 3 types of decomposition reactions <span style="float: right;">1/2</span></p> <p style="padding-left: 20px;">Thermal decomposition Ex: Breakdown of <math>\text{CaCO}_3</math> <span style="float: right;">1/2</span></p> <p style="padding-left: 20px;">Photo decomposition ex: decomposition of silver chloride <span style="float: right;">1/2</span></p> <p style="padding-left: 20px;">Electrolysis ex: decomposition of water <span style="float: right;">1/2</span></p>   | 3 |
| 24      | <p>W: Calcium carbonate <math>\text{CaCO}_3</math> <span style="float: right;">1</span></p> <p>X: Sodium Chloride <math>\text{NaCl}</math> <span style="float: right;">1</span></p> <p>Y: Sodium carbonate <math>\text{Na}_2\text{CO}_3</math> <span style="float: right;">1/2</span></p> <p>Z: Carbon dioxide <math>\text{CO}_2</math> <span style="float: right;">1/2</span></p>  | 3 |
| OR      |   |   |
|         | <p>No, it is not similar <span style="float: right;">1</span></p> <p>Ionic compounds in molten state or in their aqueous solution form they contain <b>ions</b> which help in conducting electricity <span style="float: right;">1</span></p> <p>Metals conduct the electricity because they have <b>free electrons</b> to move <span style="float: right;">1</span></p>  | 3 |
| 25      | <p>i. Electrons are added to the same shell and the nucleus pulls the electrons towards it <span style="float: right;">1</span></p> <p>ii. It forms <b>cation</b> as alkali metals <span style="float: right;">1</span></p> <p>iii. F block elements have similarities in periods <span style="float: right;">1</span></p>  | 3 |
| 26      | <p>i) <math>\text{C}_6\text{H}_6</math></p> <div style="text-align: center;">  </div> <p style="text-align: right; margin-right: 100px;">1</p> <p>ii)</p> <div style="text-align: center;">  <p style="color: blue; margin-top: 5px;">Butanone</p> </div> <p style="text-align: right; margin-right: 100px;">1</p> <p>iii) <math>\text{C}_2\text{H}_2</math> Ethyne</p> <div style="text-align: center;"> <math>\text{H} - \text{C} \equiv \text{C} - \text{H}</math> </div> <p style="text-align: right; margin-right: 100px;">1</p> |   |
|         | Iv $\text{C}_6\text{H}_{12}$  |   |

|  |   |   |
|--|---|---|
|  |  | 1 |
|  |   | 4 |

| Qn<br>Nos              | Biology<br>Value points   | Total |
|------------------------|---|-------|
| <b>XII</b><br>27<br>28 | a) $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{energy}$<br>1  | 2     |
| <b>XIII</b><br>29      | a) Phytoplanktons → zooplanktons → fish → Shark<br>1  | 1     |
| 30                     | Phototropism: The movement of plant parts in response to light .<br>1/2   | 1     |
| <b>XIV</b><br>31       | Geotropism: The movement of plant parts in response to gravity .<br>1/2   | 2     |
| 32                     | 1.Implementation of irrigation project<br>1/2<br>2. Production of electricity<br>1/2<br><br>1) Use solar water heater and cookers, install solar panel for electricity<br>1            2) Use cloth bags instead of polythene bags.<br>1<br>Diagram   | 2     |
| 33                     |    | 2     |
| <b>XV</b><br>34        | Butterfly has chitinous exoskeleton. The bat have wings made up of skin folds<br>Since both butterfly and bat use their wings for flying but do not show any resemblance in wing structure.<br>They are not homologous , but they are Analogous organs with similar function.<br><br>The important events that occur during photosynthesis in plants are: | 3     |

35

i) Absorption of light energy by chlorophyll  
1

ii) Conversion of light energy into chemical energy, splitting of water molecules into hydrogen and oxygen  
1

iii) Reduction of CO<sub>2</sub> to carbohydrates  
1

OR

In humans blood circulation in heart :  
 pulmonary circulation: Blood is pumped through right ventricle,carried to lungs by pulmonary artey after purification,oxegenated blood is brought back to the left auricle through pulmonary veins.  
 Systemic circulation: Blood is pumped through left ventricle, oxygenated blood is carried to different parts of the body through Aorta.Blood reaches tissues through capillaries supplying oxygen and finally Deoxygenated blood is brought back through veins.

When Mendel crossed pure tall pea plant(TT) with pure dwarf pea plant (tt), he Obtained all hybrid tall pea plants (Tt) in F1- generation.  
 When F1 plants were self crossed the following type of plants were got.

|    |    |    |
|----|----|----|
| F1 | T  | t  |
| T  | TT | Tt |
| t  | Tt | tt |

36

In F2 generation he got 3:1 phenotypic ratio of plant with 3 tall and 1 dwarf plant.  
 Genotypic ratio is 1:2:1

OR

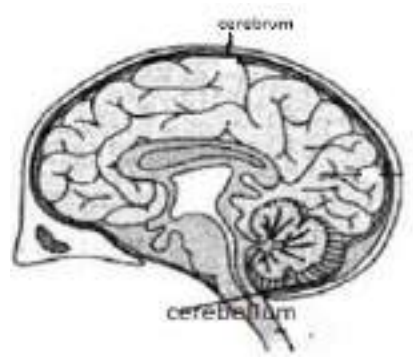
XVI  
37

A male germ cell forms two types of gametes one with X and one with Y chromosome.  
 A female germ cell carries only one type of gametes,all with X chromosomes. If a sperm carrying X chromosome fertilizes egg the child born is a Female. If a sperm carrying Y chromosome fertilizes egg the child born is a Male. Thus the sperm determines the sex of the child.

- 1) Provides nutrition to the developing embryo
- 2)It helps in attachment of foetus to the wall of uteru
- 3)It helps in exchange of CO<sub>2</sub> and oxygen

38

Diagram



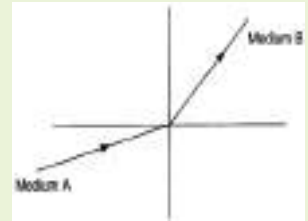
|  |   |  |
|--|---|--|
|  | <p>These variations may be either due to some environmental factors like light, scarcity of food, abundance of food, temperature etc or due to small inaccuracies in DNA copying (mutation).</p> <p>The experiences of an individual during its lifetime are acquired traits. These are changes in the non-reproductive tissue of the individual, and do not affect the DNA of the germ cell of that individual. As in reproduction, only the germ cells participate, the changes in non-reproductive tissues are not passed on to the next generation and therefore cannot direct evolution.</p> <p>For example if a person reads a book on birds the knowledge he earns by reading the book does not make any change in the gene hence this knowledge will not get automatically transmitted to his next generation. Such a trait is called acquired trait.</p> |  |
|--|---|--|

## MODEL QUESTION PAPER - 2

### PART A- PHYSICS

**I. Four alternatives are given for each question .Choose the most appropriate answer and write it down with it's alphabet given:-** **4 x 1 = 4**

1. S.I Unit of electric current is \_\_\_\_\_  
a. Ohm b. Ampere c. Watt d. Volt
2. Commercial electric motors do not use \_\_\_\_\_  
a. An electromagnet to rotate the armature  
b. A soft iron core on which the coil is wound  
c. A permanent magnet to rotate the armature  
d. Effectively the large number of turns of conducting wire in the current carrying coil.
3. Global warming is caused by the release of \_\_\_\_\_  
a. Carbon di oxide b. Sulphur di oxide c. Carbon mono oxide d. Nitrogen di oxide
4. A light ray enters from medium A to medium B as shown in figure. The refractive index of medium B relative to A will be  
a. Greater than unity b. Lesser than unity  
c. Equal to unity d. Zero



**II. Answer the following questions:-**

**2 x 1 = 2**

5. A & B are two materials pursuing the resistivities of  $2.63 \times 10^{-8}$  &  $1.84 \times 10^{-6}$ . Which among them is the good conductor of electricity. Give reason
6. When does a conductor carrying current experiences maximum force?

**III. Answer the following questions: -**

**2 x 2 = 4**

7. What are the environmental consequences of the increasing demand for energy?
8. What happens to the image distance in the eye when we increase the distance of an object from the eye?

**IV. Answer the following questions:-**

**3 x 3 = 9**

9. An object 5 cm in length is placed at a distance of 20 cm in front of a convex mirror of radius of curvature 30 cm. Find the position of the image, its nature and size.

OR

An object of size 7 cm is placed at 27 cm in front of a concave mirror of focal length 18 cm. At what distance from the mirror should a screen be placed so that a sharply focussed image can be obtained? Find the size and nature of the image.

10. Why does the sky appears dark instead of blue to an astronaut? Why does sun appears white during the noon time.

OR

How will you use two identical glass prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as white light?

11. Draw the ray diagram for a convex lens when the object is kept at  $2F_1$ , also determine the nature, size and position the image formed using the diagram.

**V. Answer the following question:-**

**1 x 4 = 4**

12. a) What is i) the highest , ii) the lowest total resistance that can be secured by the combination of four coils of resistance  $4\Omega, 8\Omega, 12\Omega$  and  $24\Omega$ ?  
b) Why does the cord of an electric heater not glow while the heating element does?

**VI. Answer the following question:-**

**1 x 5 = 5**

13. a) Imagine that you are sitting in a chamber with your back to one wall. An electron beam, moving horizontally from the back wall towards the front wall, is deflected by a strong magnetic field to your right side. What is the direction of the magnetic field? Justify your answer.

b) What is the function of an earth wire? Why is it necessary to earth metallic appliances?

### PART B- CHEMISTRY

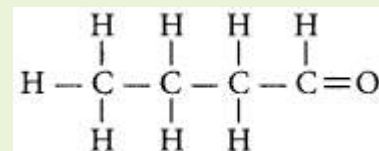
**VII. Four alternatives are given for each question .Choose the most appropriate answer and write it down with it's alphabet given:-** **2 x 1 = 2**

14. Amphoteric oxide among the following is \_\_\_\_\_  
a.  $Na_2O$       b.  $K_2O$     c.  $Al_2O_3$     d.  $MgO$
15. Esters will be formed when \_\_\_\_\_  
a. Alcohol reacts with carboxylic acid  
b. Alcohol reacts with dilute sulphuric acid  
c. Carboxylic acid reacts with a base  
d. Alcohol reacts with an aldehyde

**VIII. Answer the following questions:-**

**4 x 1 = 4**

16. Name the acid present in tamarind juice.
17. Which one of the following is a combination reaction? Why?  
a. Combustion of coal  
b. Heating Calcium carbonate.
18. Write the balanced chemical equation for the following statement given below.  
"When Magnesium metal reacts with hydrochloric acid a salt of magnesium chloride is formed with the liberation of hydrogen gas"
19. Name the following compound and write its molecular formula



**IX. Answer the following questions:-**

**3 x 2 = 6**

20. Draw the diagram to show that acid solution in water conducts electricity and label the battery.
21. Draw the diagram to show the action of steam on a metal. Label Glass Rod soaked in water.
22. How is calcination different from roasting? Metal carbonate ores are converted to their oxide ores during the process of their extraction. Why?

**OR**

"Solder is essentially used during the welding of electrical wires together". Why? Write the components of solder.

**X. Answer the following questions:-**

**3 x 3 = 9**

23. Explain the preparation of bleaching powder with chemical equation supporting it. Write any two uses of bleaching powder.

**OR**

Which chemical substance is the tooth enamel made up of? What is the reason for tooth decay? How can it be prevented.

24. Molecular formula of the first member of a group of carbon compound is  $CH_3OH$ . If the members of the group are in homologous series. Write the name and molecular formula of the third member. Write the common name of this group.
25. The brown colour of the copper powder on heating in a china dish turns black. How can we reverse the black colour of copper powder to brown? Identify the type of chemical reaction and Write its chemical equation.

**XI. Answer the following question:-**

**1 x 4 = 4**

26. a) State modern periodic law.  
b) Atomic number of aluminium is 13. Find its valency.  
c) How does the atomic size varies down the group? Give reason

### PART C: BIOLOGY

**XII. Four alternatives are given for each question .Choose the most appropriate answer and write it down with it's alphabet given:-** **2 x 1 = 2**

27. The life processes in humans are controlled and regulated by \_\_\_\_\_  
a. Reproductive & Endocrine system.  
b. Respiratory & Nervous system.  
c. Endocrine & digestive system.  
d. Nervous & Endocrine system.
28. Ahars, Kattas, Bhundhis and Khadins are the modes of \_\_\_\_\_  
a. Grain Storage      b. Water harvesting  
c. Soil conservation    d. Cold storage

**XIII. Answer the following questions:-** **2 x 1 = 2**

29. Why fertilisation cannot take place in flowers if pollination does not happen?  
30. List two causes of pollution of river ganga.

**XIV. Answer the following questions:-** **2 x 3 = 6**

31. How do you support the statement“ Pancreas is the overall controller of the blood sugar levels in the body”  
32. What are the methods used by the plants to get rid of the excretory products?

OR

Mention the importance of transpiration in plants?

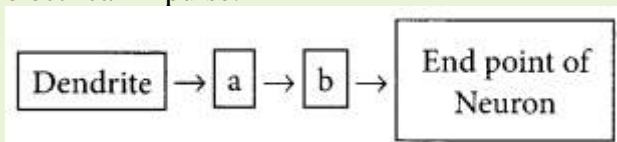
33. A group of grasshoppers some green and some brown lived in a grass land having dry bushes and dry grass.  
a) Which one would normally be picked up by the predatory birds? Why?  
b) Name the phenomenon

**XV. Answer the following questions:-** **3 x 3 = 9**

34. What is ozone? How it is formed in the atmosphere? How does it affect our eco system.  
35. State one function of each of the following hormones  
a. Auxin      b. Cytokinin      c. Abscisic acid

OR

- (a) Name one gustatory receptor and one olfactory receptor in human beings.  
(b) Write a and b in the given flow chart of neuron through which information travels as an electrical impulse.



36. A tall pea plant with red flowers (TtRr) is self pollinated. Represent the plants obtained in  $F_2$  generation with the help of checker board. Write the ratios of phenotype in  $F_2$  generation.

**XVI. Answer the following questions:-** **2 x 4 = 8**

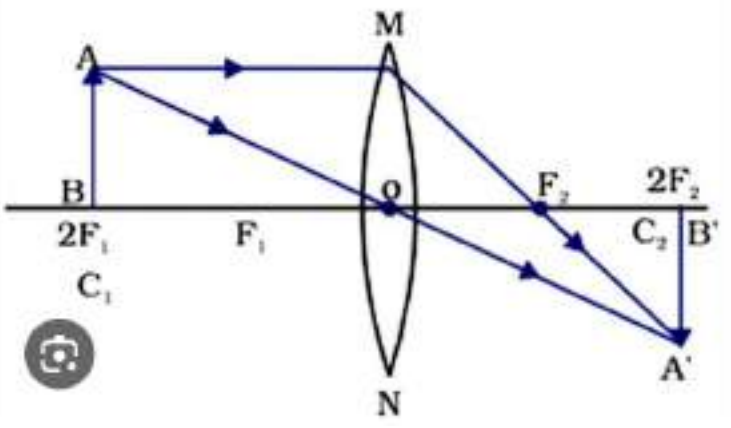
37. Draw the diagram showing the vertical section of human heart and label the following.  
a. Left ventricle      b. Pulmonary artery
38. a) “It is a matter of chance whether a couple will have a male/female child”. Justify this statement. b) What are fossils? What are the two methods of determining the age of the fossil.

OR

- a) “Evolution and classification of organisms are interlinked”. Give reasons to justify this statement.  
b) “An individual cannot pass on to its progeny the experiences of its life-time”. Justify the statement with the help of an example and also give reason for the same.
-



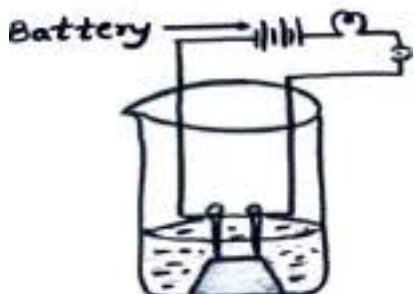
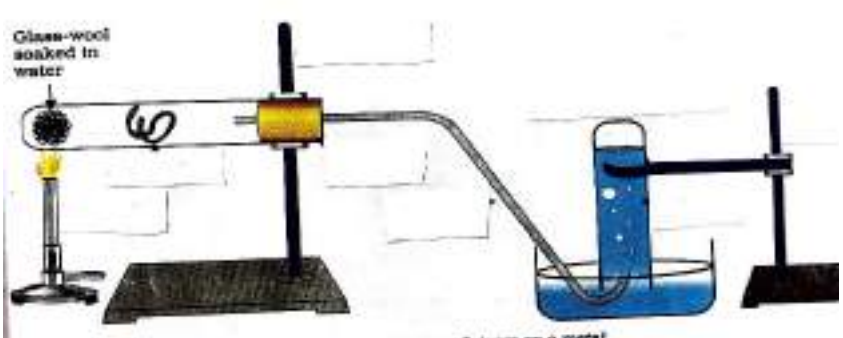


|    |  |   |
|----|--|---|
|    | <p>Size of the image is diminished.<br/>Image is formed behind the mirror 4 virtual</p>  | 1   |
| 10 | <ul style="list-style-type: none"> <li>• There is no atmosphere in the space to scatter light. Therefore sky appears dark.</li> <li>• Sunlight travel relatively shorter distance at noon</li> <li>• Only a little blue color is scattered</li> </ul> <p style="text-align: center;"><b><u>OR</u></b></p> <ul style="list-style-type: none"> <li>• One prism is kept upright</li> <li>• When while light is passed through the prism, white light is split into seven Colours</li> <li>• Another prism is kept inverted in front of the first one</li> <li>• Seven colours enter into the second prism and emerge out as a white colour</li> </ul> | <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>½</p> <p>½</p> <p>1</p> <p>1</p> |
| 11 |   | 2   |
|    | <p>Image is of the same size of the object inverted and red</p>  | 1   |
| 12 | $R_s = R_1 + R_2 + R_3 + R_4$ $= 4\Omega + 8\Omega + 12\Omega + 24\Omega$ $= 48\Omega$ $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4}$ $= \frac{1}{4} + \frac{1}{8} + \frac{1}{12} + \frac{1}{24}$ $= \frac{6 + 3 + 2 + 1}{24}$ $\frac{1}{R} = \frac{12}{24} = 2\Omega$ $R = 2\Omega$  | <p>1</p> <p>½</p> <p>½</p> <p>½</p> <p>½</p>                            |

|          |   |   |
|----------|---|---|
| VI<br>13 | b)The resistance of the heating element is very high where as resistance of the cord is less.   | 1 |
|          | <p>a) Current in the coil ABCD enters from the battery through</p> <ul style="list-style-type: none"> <li>• Brush X and flows back to battery through brush Y. <span style="float: right;">½</span></li> <li>• Current on Arm AB flows from A to B and in CD C to D. <span style="float: right;">½</span></li> <li>• According to Flemings left hand rule AB is pushed downward and CD upward <span style="float: right;">½</span></li> <li>• At half rotation splitting 'Q' makes contact with brush X and Y with brush Y. <span style="float: right;">½</span></li> <li>• Current in the coil get reversed. <span style="float: right;">½</span></li> <li>• Therefore, Arm AB is pushed upward and CD downward. <span style="float: right;">½</span></li> <li>• Reversing the current is continued at every half rotation giving rise to continuous motion of the coil and axle. <span style="float: right;">1</span></li> </ul> <p>b) The split ring acts as commutators. <span style="float: right;">1</span></p> |   |

**PART –B CHEMISTRY**

**KEY ANSWERS**

| Qn . Nos | Value points   | Total |
|----------|--|-------|
| VII      | <b>Four alternatives are given for each question. Choose the most appropriate answer and write it down with its alphabet given .</b>             |       |
|          | <b>2×1=2</b>   |       |
| 14.      | c) Al <sub>2</sub> O <sub>3</sub>  | 1     |
| 15.      | a) Alcohol reacts with carboxylic acid   | 1     |
| VIII     | <b>Answer the following questions:-</b>  |       |
|          | <b>4×1=4</b>   |       |
| 16.      | Tartaric acid  | 1     |
| 17.      | a) Combustion of coal is a combination reaction because coal combines with oxygen to give Carbondioxide.   | 1     |
| 18.      | $Mg + 2 HCl \longrightarrow MgCl_2 + H_2$  | 1     |
| 19.      | Butanal  | ½     |
|          | C <sub>3</sub> H <sub>7</sub> CHO  | ½     |
| IX       | <b>Answer the following questions:-</b>  |       |
| 20.      | <b>3×2=6</b>   |       |
|          |  <p style="text-align: right;">Diagram 1 ½ + Labelling ½</p>  | 2     |
| 21       |  |       |
|          |  <p style="text-align: right;">Diagram 1 ½ + Labelling ½</p> | 2     |

| Qn . Nos  | Value points   | Total        |          |   |   |  |
|---|--|--------------|----------|---|---|--|
| 22.   | <table border="1"> <thead> <tr> <th>Calcination</th> <th>Roasting</th> </tr> </thead> <tbody> <tr> <td>The process of heating the Carbonate ore strongly in limited air.</td> <td>The process of heating the Sulphide ore strongly in the presence of excess air.</td> </tr> </tbody> </table> | Calcination  | Roasting | The process of heating the Carbonate ore strongly in limited air. | The process of heating the Sulphide ore strongly in the presence of excess air. |  |
| Calcination   | Roasting   |              |          |   |   |  |
| The process of heating the Carbonate ore strongly in limited air. | The process of heating the Sulphide ore strongly in the presence of excess air.  |              |          |   |   |  |
|   |  | 1            |          |   |   |  |
|   | It is easier to obtain a metal from its oxide, as compared to its carbonate.   | 1            |          |   |   |  |
|   | OR   |              |          |   |   |  |
|   | Solder has a low melting point.  | 1            |          |   |   |  |
|   | Components of Solder- Lead and Tin.  | 1            |          |   |   |  |
|   |  | 2            |          |   |   |  |
| X   | <b>Answer the following questions:-</b>  | <b>3×3=9</b> |          |   |   |  |
| 23.   | Bleaching powder is produced by the action of chlorine on dry slaked lime.   | 1            |          |   |   |  |
|   | $\text{Ca(OH)}_2 + \text{Cl}_2 \longrightarrow \text{CaOCl}_2 + \text{H}_2\text{O}$  | 1            |          |   |   |  |
|   | Uses of Bleaching powder:  |              |          |   |   |  |
|   | i) for bleaching cotton and linen in the textile industry.   |              |          |   |   |  |
|   | ii) for bleaching wood pulp in paper factories   |              |          |   |   |  |
|   | iii) for bleaching washed clothes in laundry   |              |          |   |   |  |
|   | iv) as an oxidizing agent in many chemical industries  |              |          |   |   |  |
|   | v) to make drinking water free from germs.   |              |          |   |   |  |
|   | (Any two) $\frac{1}{2} + \frac{1}{2}$  | 3            |          |   |   |  |
|   | OR   |              |          |   |   |  |
|   | Calcium hydroxyapatite.  | 1            |          |   |   |  |
|   | Tooth decay is caused when the P <sup>H</sup> in the mouth is below 5.5.   | 1            |          |   |   |  |
|   | It can be prevented by using toothpastes which are generally basic.  | 1            |          |   |   |  |
| 24.   | Propanol   | 1            |          |   |   |  |
|   | $\text{C}_3\text{H}_7\text{OH}$  | 1            |          |   |   |  |
|   | Alcohol  | 1            |          |   |   |  |
|   |  | 3            |          |   |   |  |
| 25.   | By passing Hydrogen gas over it.   | 1            |          |   |   |  |
|   | Redox reaction   | 1            |          |   |   |  |
|   | $\text{CuO} + \text{H}_2 \longrightarrow \text{Cu} + \text{H}_2\text{O}$   | 1            |          |   |   |  |
|   |  | 3            |          |   |   |  |
| XI  | <b>Answer the following questions :-</b>   | <b>1×4=4</b> |          |   |   |  |
| 26.   | a) “ Properties of elements are a periodic function of their atomic number”.   | 1            |          |   |   |  |
|   | b) Valency of Aluminium = 3  | 1            |          |   |   |  |
|   | c) The atomic size increases down the group.   | 1            |          |   |   |  |
|   | This is because new shells are added as we go down the group. This increases the distance between the outermost electrons and the nucleus.   | 1            |          |   |   |  |
|   |  | 4            |          |   |   |  |
|   | *****  |              |          |   |   |  |

**SCIENCE MODEL PAPER-2**

**PART-C (BIOLOGY) KEY ANSWERS**

| Q.No        | Value points  | Marks                   |
|-------------|---|-------------------------|
| <b>XII</b>  | <b>Multiple choice questions</b>  | <b>(2X1=2)</b>          |
| 27)         | d) Nervous and endocrine system   | <b>1</b>                |
| 28)         | b) Water harvesting   | <b>1</b>                |
| <b>XIII</b> | <b>Answer the following questions</b>   | <b>(2X1=2)</b>          |
| 29 )        | Because pollination helps in transfer of pollen grains onto the stigma.   | <b>1</b>                |
| 30)         | <ul style="list-style-type: none"> <li>• Industrial waste</li> <li>• Agriculture</li> <li>• Human activities</li> <li>• Sewage</li> </ul>   | 1/2<br>1/2<br>(any two) |
| <b>XIV</b>  | <b>Answer the following questions.</b>  | <b>(3X2=6)</b>          |
| 31)         | <ul style="list-style-type: none"> <li>• When sugar level rises in blood, pancreas secretes more insulin to reduce sugar level.1</li> <li>• As the blood sugar level falls, insulin secretion reduces to maintain the sugar level. 1</li> </ul>   | <b>2</b>                |
| 32)         | <ul style="list-style-type: none"> <li>• Waste products may be stored in leaves that fall off.</li> <li>• Many waste products are stored in cellular vacuoles.</li> <li>• Excess water can be removed through transpiration.</li> <li>• Some wastes may be stored as resins and gums in old xylem.</li> </ul> | ½<br>½<br>½<br>½        |
|             | Or  |                         |
|             | <ul style="list-style-type: none"> <li>• Helps in absorption and upward movement of water and minerals from roots to leaves.</li> <li>• Temperature regulation</li> </ul>   | 1<br>1                  |
| 33)         | a) Green beetles would be easily picked up by the birds as they are clearly visible on dry brown bushes.<br>b) Natural selection  | 1<br>1                  |
| <b>XV</b>   | <b>Answer the following questions</b>   | <b>( 3X3=9)</b>         |
| 34)         | <ul style="list-style-type: none"> <li>• Ozone is a molecule formed by three atoms of Oxygen(O<sub>3</sub>)</li> <li>• UV rays split oxygen molecule into free Oxygen atoms which combine with oxygen</li> </ul>  | <b>1</b>                |

- 35) molecule to form Ozone (O<sub>3</sub>) 1
- It shields the surface of the earth from UV radiations from the sun. 1 **3**
  - Auxin: Helps the cells to grow longer 1
  - Cytokinin: Promotes cell division 1
  - Abscisic acid: Inhibits growth/ wilting of leaves 1

Or

- 36) a) Tongue and nose 1
- b) A -> Cellbody 1
- B-> Axon 1 **3**

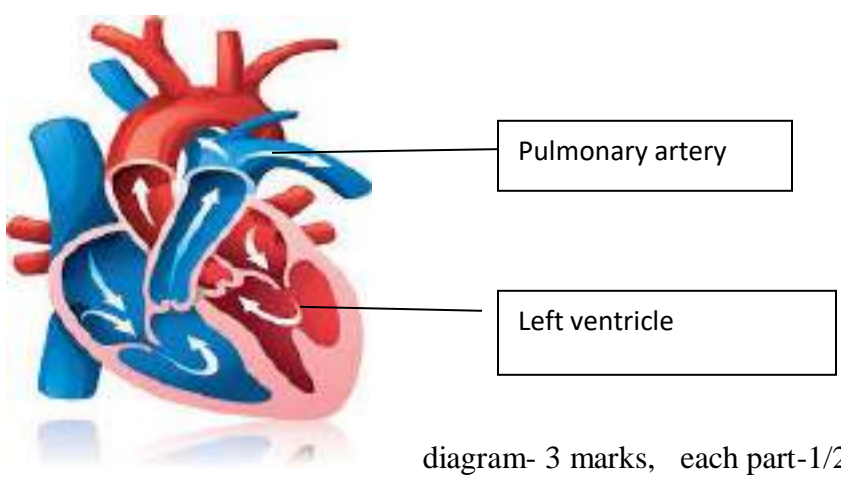
|          |      |      |      |      |
|----------|------|------|------|------|
| game tes | TR   | Tr   | tR   | tr   |
| TR       | TTRR | TTRr | TtRR | TtRr |
| Tr       | TTRr | TTrr | TtRr | Ttrr |
| tR       | TtRR | TtRr | ttRR | ttRr |
| tr       | TtRr | TtRr | ttRr | ttrr |

9:3:3:1

2  
1 **3**

**XVI Answer the following questions ( 2X4=8)**

37)



4

38)

a) \* A male produces two types of sperms X and Y, while female produces only one type X . 1  
When a sperm carrying X chromosome combines with ovum, child will be a girl, and if sperm with Y chromosome combines with ovum, child will be a boy. 1

b) Preserved traces of living organisms are called fossils. 1  
Relative method and carbon dating 1

Or

a) Evolution is based on similarities and variations between two species/organisms. More closer the characteristics, more closer is the evolution and chances to be in the same group of classification. 2

b) The traits acquired during the lifetime of an individual don't change the genetic material. If the tails of the parent mice is cut through surgery their off spings will be having tails. 2

4

--: \$\$\$\$\$\$\$\$\$\$\*\*\*\$\$\$\$\$\$\$\$\$\$ :--



**MODEL QUESTION PAPER-3**  
**PART-A PHYSICS**

**I. Four alternatives are given for each of the following questions /incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.**

**2 x 1 = 2**

- The Refractive indices of four medium P,Q,R And S Are 1.44, 1.47, 1.33 and 1.22 respectively The velocity of light is maximum in.  
a) medium Q    b) medium S    c) medium R    d) medium P
- The term “accommodation” as applied to eye is ability to  
a) control the amount of light entering retina  
b) erect the image formed on retina  
c) vary the distance between lens and retina  
d) vary the focal length of the lens

**II. Answer the following Questions :**

**3 x 1 = 3**

- Mention the S.I. unit of Resistivity.
- State the Right hand thumb rule.
- Find the focal length of lens if its power is +2.0 D

**III. Answer the following Questions :**

**3 x 2 = 6**

- Draw the diagram of simple electric generator, Label the following parts:

a) Rings    b) Brushes

**OR**

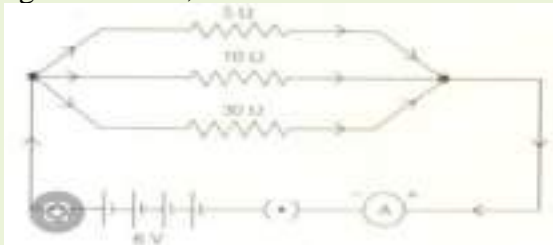
Draw the diagram of simple electric motor, Label the parts.

- The focal length of a convex lens is 8 cm, If an object is placed at a distance of 12 cm from the lens, then find the position of image.
- What is Atmospheric refraction ? “planets do not twinkle” why ?

**IV. Answer the following Questions :**

**3 x 3 = 9**

- In the circuit given bellow, find



- Effective resistance in circuit
- Total current in the circuit
- Current through 10 Ω resistor

**OR**

An electric heater draws current of 10A from 220 V supply. Find the cost of using heater for 3 hours everyday for 30 days , if the cost of 1 KWh is Rs 5.20 ?

- Draw ray diagram to show the position of image formed by a concave mirror if the object is placed between principal focus and center of curvature. Write the nature of image so obtained.
- A certain form of energy is available due to difference in temperature of water at surface of ocean and its deeper level.  
a) Name the form of energy.  
b) Explain how this form of energy can be converted to electricity.

**OR**

‘To generate hydroelectricity by constructing dams on GANGA river is of lot opposition’ Justify the statement with atleast any three reasons.

**V. Answer the following Questions :**

**4 x 2 = 8**

- a) Define the term Resistance.  
b) Mention the factors on which resistance depends upon.

- c) what happens to resistance if diameter of wire is halved ?
13. Explain Faraday's method to demonstrate Electromagnetic induction by using coil and bar magnet.

### PART-B CHEMISTRY

**VI. Four alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.**

**2 x 1 = 2**

14. Exothermic reaction among the following is,  
 A) Silver chloride turns grey on exposure to sun light  
 B) Break down of glucose to carbon di oxide  
 C) Brown fumes appears on heating lead nitrate  
 D) water forms hydrogen and oxygen on passing electricity
15. Periodic law based on 'atomic number' is  
 A) modern periodic law                      B) Mendeleev's periodic law  
 C) Newland's periodic law                    D) Dobereiner's periodic law

**VII. Answer the following Questions :**

**1 x 1 = 1**

16. What is catenation ?

**VIII. Answer the following Questions :**

**2 x 2 = 4**

17. Draw a diagram for the arrangement of apparatus to show that acid solution conducts electricity and label dilute HCL solution.
18. copper sulphide and zinc carbonate ores are given, mention the method of extracting copper and zinc from their ores. Write the differences.

**IX. Answer the following Questions :**

**3 x 3 = 9**

19. Write the balanced chemical equations for the following reactions and identify the type of reactions.  
 a) Magnesium + hydrogen chloride  $\longrightarrow$  Magnesium chloride + hydrogen  
 b) Hydrogen + Nitrogen  $\longrightarrow$  Ammonia

20. Mention the substances elements liberated at cathode and anode during chlor-alkali process. When the element liberated at anode is made to react with slaked lime ? list any two uses of their product. Name the product Obtained.

**OR**

Name the products obtained when sodium hydroxide reacts with hydrochloric acid. what is the name of this reaction ? name the ions generated from the above reactants when they react with water.

To get rid of the pain and irritation caused due to indigestion, doctors suggest milk of magnesia and not sodium hydroxide . why?

21. Explain the reaction of following metals with water, and represent it with balanced equation (a) Potassium (b) Magnesium (c) Aluminium.

**X. Answer the following Questions :**

**4 x 1 = 4**

22. Observe the given table ,answer the following questions giving appropriate reason.

| Group \ Period | 2 | 14 | 16 | 17 |
|----------------|---|----|----|----|
| 2              | A |    |    |    |
| 3              |   | B  |    | C  |
| 4              | D |    |    |    |

- (i) State whether B is a metal or non – metal.  
 (ii) which one has more atomic radius?  
 (iii) among A& D which element is less reactive?  
 (iv) what is the valaney of C?

**OR**

The table shows the relative position of the elements A, B, C, D in the periodic table.

| Group 1 | Group 16 | Group 17 |
|---------|----------|----------|
| -       | -        | -        |
| D       | A        | -        |
| -       | C        | B        |

- Which elements are metals among them?
- Which element has highest atomic size among them and why ?
- Which type of ion is produced by the element A?

**XI. Answer the following Questions :**

**5 x 1 = 5**

- Write the electron dot structure of methane.
  - Name the products obtained when methane undergoes complete combustion
  - Explain esterification. How are soaps produced ? Explain its action on dirt.

**PART-C BIOLOGY**

**XII. Four alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.**

**4 x 1 = 4**

- Stages of photosynthesis are given below.
  - Conversion of water molecules into Hydrogen and oxygen
  - Absorption of light energy by chlorophyll
  - Conversion of light energy into chemical energy
  - Conversion of CO<sub>2</sub> into carbohydrate
 Proper sequence of these stages among the following is
  - i – ii – iii – iv
  - i-iii-ii-iv
  - ii – iii – i – iv
  - ii- iii – iv – i
- Which among the following processes is not a cause for speciation?
  - Mutation
  - Genetical drift
  - Natural selection with gene flow
  - Change in asexual factors
- The figures given below show different types of reproduction. The figure which does not belong in the group is



- Fill the blank in the second pair of words by considering the relation of first pair of words **Auxin : Elongation of cells :: Absisic acid : \_\_\_\_\_**
  - Inhibits growth
  - Stimulate cell division
  - Plant bends towards light
  - Helps in the growth of stem

**XIII. Answer the following Questions :**

**4 x 1 = 4**

- Name an organism which reproduce through binary fission ?
- How do we estimate the age of fossils through relative method ?
- Arteries have thick elastic walls when compared to veins. Why?
- How is the sex of the child determined in human beings?

**XIV. Answer the following Questions :**

**2 x 3 = 6**

- Two green plants are taken in oxygen free containers. One is kept in dark and the other is kept in sunlight. Which one can live long? Why?



# SCIENCE QUESTION PAPER

SET:3

## PART A: PHYSICS

### Key Answers

| Qn.Nos |   | Total      |
|--------|---|------------|
| I      |   |            |
| 1.     | B) medium S.  | 1          |
| 2.     | C) Vary the distance between the lens and retina.   | 1          |
| II     |   |            |
| 3.     | ohm metre.  | 1          |
| 4.     | Imagine a current carrying a straight conductor in a right hand such that thumb points towards the direction of the current.<br>Fingers around the conductor shows the direction of magnetic field lines. | 1/2<br>1/2 |
| 5.     | $P=1/f$<br>$2=1/f$<br>$f=1/2$<br>$f=0.5m; 50cm$   | 1/2<br>1/2 |
| 6.     | Diagram<br>Label the parts  | 1<br>1     |
| 7.     | $f=8cm ; u= -12cm ; v=?$<br>$1/v - 1/u = 1/f$<br>$1/v - 1/-12= 1/8$   | 1/2        |

|    |  |                            |
|----|--|----------------------------|
|    | $1/v + 1/12 = 1/8$ $1/v = 1/8 - 1/12$ $1/v = (3-2)/24$ $1/v = 1/24$ $\Rightarrow V = 24\text{cm.}$   | <p>1</p> <p>1/2</p>        |
|    | <p>8. The refraction of light caused by earth's atmosphere having air layers of different densities is called atmospheric refraction.</p> <p>The continuously changing atmosphere is unable to cause variation in light coming from big sized planet, because of which planets do not twinkle.</p>   | <p>1</p> <p>1</p>          |
| IV | <p>9. (i) Total resistance in parallel= <math>1/R_1 + 1/R_2 + 1/R_3</math></p> $1/5 + 1/10 + 1/30$ $= (6+3+1)/ 30$ $= 10/30$ $= 1/3$ $= 3\text{ohm.}$ <p>(ii) <math>I = V/R</math></p> $I = 6/3$ $\Rightarrow I = 2\text{A}$ <p>(iii) <math>I = V/R</math></p> $I = 6/10$ <p><math>I = 0.6\text{A}</math> flows through <math>10\text{ohm}</math> resistor.</p> <p style="text-align: center;">OR</p> $P = V \times I$ $P = 220 \times 10$ | <p>1</p> <p>1</p> <p>1</p> |

|     |   |               |
|-----|---|---------------|
|     | P= 2200W  |               |
|     | Or  | 1             |
|     | P= 2.2Kw  |               |
|     | Total electrical energy consumed in 30 days= $2.2 \times 3 \times 30$   |               |
|     | E = 198 Kwh   | 1             |
|     | Cost of one unit= Rs. 5.20  |               |
|     | Cost of 198 units= $5.20 \times 198$  | 1             |
|     | = Rs. 1029  |               |
| 10. | Diagram   | 2             |
|     | Nature of the image   | 1             |
| 11. | (a) Ocean thermal energy  | $\frac{1}{2}$ |
|     | (b) Ocean thermal energy plants can operate in difference in temperature of water at surface level and deeper levels.     | 1             |
|     | The warm surface water is used to boil volatile liquids like ammonia.   | 1             |
|     | The vapours are then used to run turbines of generators to produce electricity.   | $\frac{1}{2}$ |
|     | OR  |               |
|     | Construction of dams on the rivers has certain problems with it:  |               |
|     | (i) Large area of the agricultural land and human habitations might get submerged.  | 1             |
|     |   | 1             |
|     | (ii) Destruction of large eco-system.   | 1             |
|     | (iii) Vegetation in submerged in water, due to anaerobic conditions gives rise to methane gas, causing greenhouse effect. |               |
| V   |   |               |
| 12. | (a) Obstruction of the flow of electrons is called resistance.  | 1             |

|     |  |   |
|-----|--|---|
| 13. | <p>(b) Resistance depends upon:</p> <ul style="list-style-type: none"> <li>- length of the wire</li> <li>- area of cross-section of the wire.</li> <li>- nature of the material (any two)</li> </ul> <p>(c) Resistance increases 4 times.</p> <p>* Take a bar magnet and push inside the coil.</p> <p>Galvanometer shows the deflection indicating the presence of current.</p> <p>* When magnet is removed from the coil, the galvanometer shows deflection</p> <p>in opposite direction due to the flow of current.</p> <p>* When both magnet and coil are at rest, no deflection is observed.</p> <p>* When there is a relative motion between magnet and a coil, electricity is produced. This shows that, magnetism produces electricity.</p> | <p>2</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> |
|-----|--|---|



# SCIENCE QUESTION PAPER

SET : 3

**Part B : CHEMISTRY**

**Key Answers**

**VI**

|    |   |   |
|----|---|---|
| 14 | B) breakdown of glucose to carbon dioxide | 1 |
| 15 | A) Modern periodic law                    | 1 |

**VII**

|    |   |   |
|----|---|---|
| 16 | The unique property of carbon to form long chain compound with other carbon atoms | 1 |
|----|---|---|

**VIII**

|    |   |                       |
|----|---|-----------------------|
| 17 | Drawing : acid solution in water conducts electricity   | 1 ½<br>½<br>2         |
| 18 | Copper sulphide : by Roasting<br>Zinc carbonate : by Calcination<br>Roasting is the process of heating the sulphide ores strongly in the presence of excess oxygen to form oxides.<br>Calcination is heating the carbonate ores in strongly in the limited air. | ½<br>½<br>½<br>½<br>2 |

**IX**

|    |   |  |
|----|---|--|
| 19 | a) $Mg + 2 HCl \rightarrow MgCl_2 + H_2$<br>Oxidation reaction<br><br>b) $H_2 + N_2 \rightarrow NH_3$<br>Combination reaction   | 1<br>½<br><br>1<br>½<br>3  |
| 20 | Hydrogen at cathode<br>Chlorine at anode<br>Bleaching powder is formed.<br>Uses of bleaching powder:<br>1. For bleaching cotton in linen and textile industry<br>2. Bleaching wood pulp in paper industry<br>3. Bleaching washed clothes in laundry<br>4. As an oxidizing agent in many chemical industries<br>5. To make drinking water free from germs (any two uses)<br><br>OR<br><br>Sodium chloride and water.<br>Neutralization reaction.<br>When hydrochloric acid is dissolved in water it forms hydronium ions | ½<br>½<br>1<br>½<br>½<br><br><br><br><br><br><br><br>3<br><br><br><br><br><br><br>1/2+½<br>½ |

|    |   |                       |   |
|----|---|-----------------------|---|
|    | (H <sub>3</sub> O <sup>+</sup> )<br>Hydroxide ions are formed when sodium hydroxide is dissolved in water. Sodium hydroxide is a strong base, whereas magnesium hydroxide is a mild base which helps to neutralize excess acid in the stomach.  | ½<br>½<br>½           | 3 |
| 21 | (a) $2K + H_2O \rightarrow KOH + H_2$<br>Potassium reacts with cold water to form potassium hydroxide and hydrogen gas is liberated.<br><br>(b) $Mg + 2H_2O \rightarrow Mg(OH)_2 + H_2$<br>Magnesium reacts with hot water and forms Magnesium hydroxide, during this process Hydrogen gas is liberated.<br><br>(c) $2Al + 3H_2O \rightarrow Al_2O_3 + H_2$<br>Aluminium reacts with steam to form Aluminium oxide, and liberates Hydrogen gas. | ½<br>½<br>½<br>½<br>½ | 3 |

### X

|    |   |  |            |
|----|---|--|------------|
| 22 | (i) B is a metalloid, because its valency is 4 and it forms covalent bond when it reacts with other elements.<br>(ii) D, because it is in 4 <sup>th</sup> period, and has 4 shells.<br>(iii) D is more reactive, because it has more atomic radius.<br>(iv) Valency of C is 7 or 1, because its combining capacity is 1<br><br>OR<br><br>(i) D, as it is in group 1, it readily donates/ loses one electron.<br>(ii) C, its atomic size is greater than B because atomic size decreases across the period.<br>(iii) Anions, because its combining capacity is 2<br>(iv) Valency of A is 2 | 1<br>1<br>1<br>1<br><br>1<br>1<br>1<br>1 | 4<br><br>4 |
|----|---|--|------------|

### XI




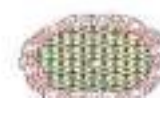

|    |  |                           |   |
|----|--|---------------------------|---|
| 23 | (i) Electron dot structure of methane : Fig 4.5<br>(ii) Carbon dioxide and water<br>(iii) When carboxylic acid reacts with alcohol, ester is formed. This process is called esterification.<br>(iv) When esters are made to react with sodium hydroxide, they form alcohol and sodium salts of carboxylic acids, which are nothing but soaps.<br><br>The sodium end of the soap reacts with water and carbon chain of the soap reacts with dirt and forms micelles by emulsifying with water. Thus the micelles pull out the dirt. | 1<br>1<br>1<br>1<br><br>1 | 5 |
|----|--|---------------------------|---|

CODE: 83-E (BIOLOGY)


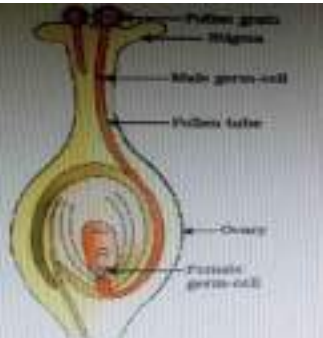
MODEL ANSWERS


Set-3

PART-C

| Qn No: | VALUE POINTS  | TOTAL     |
|--------|---|-----------|
| XII    | <b>Multiple Choice Questions:</b>   | 4 × 1 = 4 |
| 24     | <p>Stages of photosynthesis are given below.</p> <p>i) conversion of water molecules into Hydrogen and Oxygen</p> <p>ii) Absorption of light energy by chlorophyll</p> <p>iii) conversion of light energy into chemical energy</p> <p>iv) conversion of CO<sub>2</sub></p> <p>proper sequence of these stages among the following is</p> <p>a) i-ii-iii-iv                      b) i-iii-ii-iv</p> <p>c) ii-iii-i-iv                      d) ii-iii-iv-i</p> <p>Ans:<br/><b>c) ii-iii-i-iv</b></p>  | 1         |
| 25     | <p>Which among the following processes is not a cause for speciation?</p> <p>a) Mutation                                      b) Genetic drift</p> <p>c) Natural selection with gene flow                      d) Changes in asexual factors</p> <p>Ans:<br/><b>d) Change in asexual factors</b></p>  | 1         |
| 26     | <p>The figures given below show different types of reproduction. The figure which does not belong to the group is</p> <p>a) </p> <p>b) </p> <p>c) </p> <p>d) </p> <p>Ans:<br/>b)</p> <p></p> | 1         |
| 27     | <p>Fill in the blank in the second pair of words by considering the relations of first pair of words    Auxin: Elongation of cells : : Abscisic acid: _____</p> <p>a) Inhibits growth                      b) Stimulates cell division</p> <p>c) plant bends towards light                      d) helps in growth of stem</p> <p>Ans: <b>a) Inhibits growth</b></p>  | 1         |

|      |   |                  |   |
|------|---|------------------|---|
| XIII | <b>Answer the following Questions:</b>  | $4 \times 1 = 4$ |   |
| 28   | Name an organism which reproduce through binary fission?<br><br><b>Ans:</b><br><b>Amoeba or Leishmania</b>  |                  | 1 |
| 29   | How do we estimate the age of fossils through relative method?<br><br><b>Ans: Fossils which are found closer to the surface are more recent than the fossils which are found in deeper layers.</b>  |                  | 1 |
| 30   | Arteries have thick elastic walls when compared to veins. Why?<br><b>Ans: Arteries carry blood away from the heart to various parts of the body. Blood emerges from the heart under high pressure, therefore arteries have thick and elastic walls.</b>   |                  | 1 |
| 31   | How is sex of the child determined in human beings?<br><b>Ans: The female egg always has an X chromosome. So if the male gamete with the X chromosome fuses with the female egg, the child will be female (XX). Similarly, if the male gamete with the Y chromosome fuses with the female egg, the child will be male (XY).</b>   |                  | 1 |
| XIV  | <b>Answer the following questions:</b>  | $2 \times 3 = 6$ |   |
| 32   | Two green plants are taken in oxygen free containers. One is kept in dark and the other is kept in sunlight. Which one can live long? Why?<br><br>(OR)<br><br>Write the methods of excretion in plants.<br><br><b>Ans:</b><br><b>The plant which is being kept in light would live longer because carbon dioxide shall be utilized during photosynthesis and Oxygen will be released, Whereas the plant which is being kept in dark, would die as there is no sunlight to perform photosynthesis and there will no release of oxygen.</b><br><br>(OR)<br><br><b>Ans: (any 4 points)</b> <ul style="list-style-type: none"> <li>• <b>Plant releases oxygen as one of the waste products generated during photosynthesis.</b> <span style="float: right;">1/2</span></li> <li>• <b>Through transpiration, plant removes excess water from its body.</b> <span style="float: right;">1/2</span></li> <li>• <b>Wastes are stored in cellular vacuoles and leaves that fall off.</b> <span style="float: right;">1/2</span></li> <li>• <b>Waste products are stored as resins and gums.</b> <span style="float: right;">1/2</span></li> <li>• <b>Plants also secrete some waste substances into the soil around them.</b></li> </ul> |                  | 2 |

|    |   |   |
|----|---|---|
| 33 | <p>Which hormone is responsible for making our body ready to face emergency?<br/>Where is it produced?</p>  |   |
|    | <p><b>Ans:</b><br/><b>Adrenaline hormone is responsible for making our body ready to face emergency. It is produced by the Adrenal gland (1+1)</b></p>  | 2 |
| 34 | <p>“Forests are blessing boons of tribal and villagers” Justify along with Reasons.</p>   |   |
|    | <p><b>Ans:</b><br/><b>Tribal people and villagers are dependent on the forests for various products that are essential for the sustenance of their lives such as timber, medicinal plants, fibres for making clothes, fodder for cattle, various fruits and vegetables for nutrition.</b></p>   | 2 |
| XV | <p><b>Answer the following Questions:</b> <span style="float: right;"><b>3 × 3 = 9</b></span></p>   |   |
| 35 | <div style="text-align: center;">  </div> <p>a) Name the disorder which can arise by the deficiency of the hormone secreted by the gland labelled as 'A' in the above figure.</p> <p>b) which is the important component of the hormone secreted by the gland labelled as 'B' in the above figure?</p> <p>c) what is the important role of the hormone secreted by gland 'B' in the figure?</p> |   |
|    | <p><b>Ans: a) Dwarfism 1</b><br/> <b>b) Iodine. 1</b><br/> <b>c) it helps in the maintenance of metabolism of carbohydrate, protein and fat in our body 1</b></p>   | 3 |
| 36 | <p>Write a neat labelled diagram to show the germination of pollens on stigma.</p>  |   |
|    | <div style="text-align: center;">  </div>  | 3 |

|           |  |   |
|-----------|--|---|
| 37        | <p>In a classroom teacher says “evolution of feathers had nothing to do with flight”. Can you agree teachers’ statement? Explain.</p> <p>(OR)</p> <p>Biologists do not agree that ‘Humans are evolved by Chimpanzees’. Why?</p> <p><b>Ans: yes, the statement given by the teacher is correct as the feathers evolved just to maintain body temperature in birds by providing insulation against extreme tempertature. But later the feathers were used by birds for flying as well inspite of those species having a light weight. Dinosaurs also had feathers and this was for insulation against cold and later used for gliding purpose.</b></p> <p>(OR)</p> <p><b>Because humans and chimpanzees would have had a common ancestor and evolved separately in two different ways. Thus, resulted in present day man and modern chimpanzees.</b></p> | 3 |
| XVI<br>38 | <p>Answer the following questions: <span style="float: right;"><math>4 \times 1 = 4</math></span></p> <p>Write a neat diagram to show the structure of section of human heart and label the following parts.</p> <p>a) Aorta                      b) Pulmonary artery</p>   | 4 |
|           |  |   |

## MODEL QUESTION PAPER - 4

### Part – A PHYSICS

**I. Four alternatives are given for each of the following question/incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.**

3 X 1 = 3

- The device to detect the flow of charges in an electric circuit  
a) Voltmeter      b) Rheostat      c) Galvanometer      d) Commutator
- The focal length of a convex lens is 2 meters. Its power is .....  
a) 2D      b) -2D      c) 0.5D      d) -0.5D
- A person is advised to use convex lens as remedy to his eye defect. He is suffering from.....  
a) Myopia      b) Hypermetropia      c) Cataract      d) Night Blindness

**II. Answer the following questions**

2 X 1 = 2

- Tungsten is used in electric bulbs. Why?
- Mention one difference between convex lens and concave lens.

**III. Answer the following questions**

3 X 2 = 6

- A concave lens of focal length 15 cms forms an image 10 cms from the lens. How far is the object placed from the lens?
- Mention the factors on which resistance of a conductor depend?

OR

Define the term resistivity. Write its unit.

- Draw a neat diagram of DC Motor and label the following parts.

- Split rings
- Carbon brushes

**IV. Answer the following questions**

3 X 3 = 9

- Draw a ray diagram showing the image formed by concave mirror when the object is placed between F and C. Write the nature and size of the image.

- Three resistors of  $2\Omega$ ,  $3\Omega$  and  $5\Omega$  are connected in an electric circuit. Calculate.

- Maximum effective resistance
- Minimum effective resistance

OR

Calculate the resistivity of a metal of length 2 meters at  $20^{\circ}\text{C}$  having the resistance of  $20\Omega$  and diameter of 0.3mm

- Name any three forms of energy of the oceans which can be converted into usable forms of energy. Describe how it is done in each case.

OR

Explain the principle of working, advantages and disadvantages of using a solar cooker.

**V. Answer the following questions**

2 X 4 = 8

- Give scientific reasons.

- Sky appears blue
- Stars twinkle
- Clouds appear white
- Danger signals are made of red colour.

- Explain the phenomenon of Electromagnetic induction with the help of an activity. Mention the factors on which induced EMF in a coil depend.

## PART B – CHEMISTRY

VI. Four alternatives are given for each of the following question/incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.

3x1=3

14. The gas used in chips packets for preventing oxidation is \_\_\_\_\_

- a) Nitrogen    b) Oxygen    c) Hydrogen    d) Helium

15. Milk of Magnesium is \_\_\_\_\_

- a) Magnesium Oxide    b) Sodium Hydroxide  
c) Potassium Hydroxide    d) Magnesium Hydroxide

16. The functional group present in the given carbon compound  $\text{CH}_3\text{COOH}$  is \_\_\_\_\_


- a) Alcohol    b) Aldehyde    c) Carboxylic acid    d) Ketone

VII. Answer the following questions

3X1 = 3

17. What is Calcination?

18. Find the number of Neutrons in  ${}_{11}\text{Na}^{23}$ .

19. A  B Name the parts A & B in the given figure.

Micelle

VIII. Answer the following questions

3x2 = 6

20. Write any two limitations of mendeleev's periodic law.

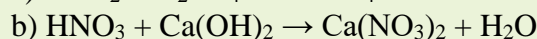
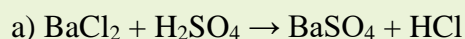
OR

An atom has an electronic configuration 2,8,7

Then a) Name the element

b) Is the element a metal or non metal

21. Balance the following chemical equations



22. Draw the diagram showing the conduction of electricity in acid solution in water.

IX. Answer the following questions

3X3 = 9

23. What are structural Isomers? Write the structure of n-Butane and Iso Butane.

OR

Explain with equations when ethanoic acid reacts with carbonate and Hydrogen carbonate

24. Draw the diagram showing the action of steam on a metal.

25. Give scientific reasons

a) Why does tooth decay start when  $\text{P}^{\text{H}}$  of mouth is lower than 5.5?

b) Sodium hydrogen carbonate is also an ingredient in antacids.

c) Bleaching powder is used in paper factories.

X. Answer the following questions

4 X 1 = 4

26. a) Distinguish between physical properties of metals and non metals (any four)

b) Write the formation of Magnesium Chloride ( $\text{MgCl}_2$ ) by the transfer of electrons.

OR

a) What are amphoteric oxides? Give 2 examples of amphoteric oxides.

b) Name the constituents of Bronze and Solder.



**PART –C BIOLOGY**

**XI. Four alternatives are given for each of the following question/incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.**

**2x1=2**

27. Consider the following food chain: Fish, Crab, Plankton and shark

Adjust the upper organisms to the trophic level they belongs to

- a) Crab, Fish, Plankton, Shark
- b) Fish, Plankton, Crab, Shark
- c) Plankton, Fish, Crab, Shark
- d) Shark, Crab, Fish, Plankton

28. Khadin, Nadis, Bundis, Ahar are ancient structures used for

- a) Water Storage
- b) Grain Storage
- c) Wood Storage
- d) Soil Conservation

**XII. Answer the following questions.**

**3 X 1 = 3**

29. How does ozone protect life on earth?

30. List two items which can be easily recycled but we generally throw them in the dust bin.

31. State two important uses of Dams.

**XIII. Answer the following questions.**

**2 X 2 = 4**

32. An old man is advised by his doctor to take less sugar in his diet. Name the disease from which the man is suffering? Mention the hormone due to imbalance of which he is suffering from this disease.

33. Write a diagram of germination of pollen on stigma.

**XIV. Answer the following questions.**

**3 X 3 = 9**

34a) explain the terms:

- i) Implantation
- ii) Placenta
- b) What is the average duration of human pregnancy?

35 a) How does relative method help to determine the age of fossils?

- b) Experiences of an individual during its life time cannot direct evolution. Why?
- c) 'Chromosomes inherited from the father determines the sex of a child'. Explain.

OR

What are fossils? How do they help in the study of evolution?

36. A green stemmed rose plant denoted by (GG) and a brown stemmed rose plant denoted by (gg) are allowed to under go a cross with each other.

List your observations regarding

- i) Colour of stem in their F1 progeny
- ii) Percentage of brown stemmed plants in F2 Progeny if plants are self *pollinated*.
- iii) Ratio of GG and Gg in the F2 Progeny.

**XV. Answer the following questions.**

**1 X 4 = 4**

37. Draw the diagram showing structure of human brain. Label the following parts

- a. Cerebrum
- b. Cerebellum

**XVI. Answer the following questions.**

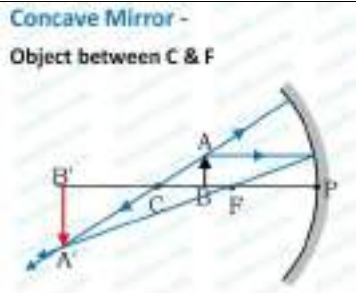
**1 X 5 = 5**

38. a) State the role of the following in human digestive system.

- i) Pepsin
- ii) Hydrochloric acid
- iii) Villi

b) State two differences between arteries and veins.





Nature: Real inverted  
Size: enlarged

1/2  
1/2

10.

$R_1 = 2\Omega, R_2 = 3\Omega, R_3 = 5\Omega$

(i) Maximum effective resistance (Series connection)

$$R_S = R_1 + R_2 + R_3 = 2 + 3 + 5 = 10\Omega \quad \underline{R_S = 10\Omega}$$

(ii) Minimum effective resistance (parallel connection)

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

$$\frac{1}{R_p} = \frac{1}{2} + \frac{1}{3} + \frac{1}{5}$$

$$\frac{1}{R_p} = \frac{15 + 10 + 6}{30} = \frac{31}{30}$$

$$\frac{1}{R_p} = \frac{31}{30}$$

$$R_p = \frac{30}{31}\Omega = 0.97\Omega$$

$$\underline{R_p = 0.97\Omega}$$

(OR)

$$\dot{\rho} = ? \quad L = 2m \quad R = 20\Omega$$

$$\dot{\rho} = \frac{RA}{L} = \frac{20 \times 4950 \times 10^{-10}}{2 \times 7}$$

$$\dot{\rho} = \frac{4950}{7} \times 10^{-9}$$

$$\dot{\rho} = 707 \times 10^{-9} \Omega m$$

$d = 0.33 \text{ mm}$   
 $r = 0.33/2 \text{ mm} = 0.15 \text{ mm} = 0.15/1000 \text{ m}$   
 $r = 15 \times 10^{-5} \text{ m}$

$A = \pi r^2 = 22/7 \times (15 \times 10^{-5})^2$   
 $= 22/7 \times 225 \times 10^{-10} = 4950 / 7 \times 10^{-10}$   
 $A = 707 \times 10^{-10} \text{ m}^2$

1/2

1/2

1

1

1

11)

- a) Wave energy
- b) Tidal energy
- c) Ocean thermal energy

Waves carry lot of energy. Wave energy generators are installed where waves are strong to produce electricity

Rise and fall of level of water due to gravitational force of sun & moon results in tides. Tidal energy can also be converted to electrical energy.

The difference in temperature of ocean surface and cooler deep areas is used to produce electricity

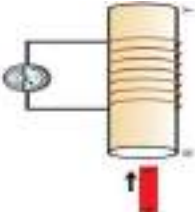
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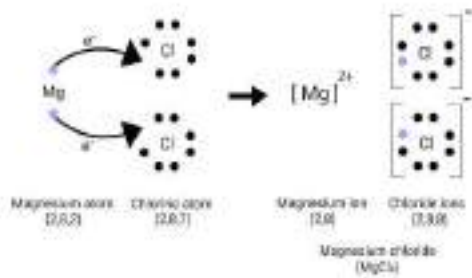
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1

1

|      |   |                            |
|------|---|----------------------------|
|      | <p>Solar cooker is a device to cook food using solar energy.</p> <p><b>Principle:</b> Solar energy is concentrated by using plane mirror reflector to increase the heat energy, the food to be cooked is placed in metal container and kept inside a box, painted black to absorb light energy. The box is covered by transparent glass as it is a thermal insulator the increased heat cooks the food.</p> <p><b>Advantage:</b> Saves conventional energy sources, Eco friendly.</p> <p><b>Disadvantage:</b> Solar energy is not constant, takes more time to cook food.</p> | 1<br>½<br>½                |
| V    | <p>12) <span style="float: right;">2x4=8</span></p> <p>i) Due to scattering of light. Blue color has shorter wave length, hence scattered most.</p> <p>ii) Due to atmospheric refraction.</p> <p>iii) All the colours are scattered by clouds. Hence appears white.</p> <p>iv) Red colour is least scattered as it has longer wave length.</p>  | 1<br>1<br>1<br>1           |
|      | <p>13)</p> <p>Whenever a magnet is inserted in a coil or taken out of the coil which is connected to a galvanometer, an EMF is induced in the coil. This is due to the change in magnetic field. This is called electromagnetic induction.</p> <p><b>Factors:</b></p> <p>i) Number of turns of the coil.      ii) Rate of change of magnetic field,</p> <div style="text-align: center;">  </div>   | 2<br>1<br>1                |
| VI   | <p><b>Part- B Chemistry</b></p>   | 1x3=03                     |
|      | <p><b>MCQ</b></p> <p>14) a) Nitrogen</p> <p>15) d) Magnesium Hydroxide</p> <p>16) c) Corboxylic acid</p>  | 1<br>1<br>1                |
| VII  | <p>17) The carbonate ores are changed into oxides by heating strongly in limited air</p> <p>18) 23-11 = 12</p> <p>19) A - Hydrophilic Head<br/>B - Hydrophobic end</p>  | 1x3=03<br>1<br>1<br>1      |
| VIII | <p>20) a) No fixed position given to hydrogen in periodic table</p> <p>b) The atomic masses do not increase in a regular manner in going from one element to the next</p> <p>c) Position of isotopes cannot be explained.</p> <p style="text-align: center;"><b>(any two)</b></p> <p style="text-align: center;">OR</p> <p>a) Chlorine</p> <p>b) Non-metal</p>  | 2x3=06<br>1<br>1<br>1<br>1 |
|      | <p>21) a) <math>BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + 2HCl</math>,</p> <p>b) <math>2HNO_3 + Ca(OH)_2 \rightarrow Ca(NO_3)_2 + 2H_2O</math></p>  | 1<br>1                     |
|      | 22)   |                            |





OR


a) Metal oxides which react with both acids as well as bases to produce salts and water are known as amphoteric oxides.

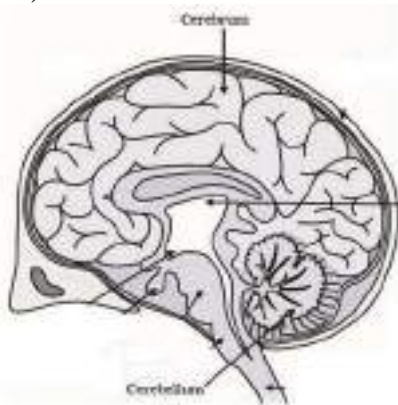
Ex:- Aluminum oxide (Al<sub>2</sub>O<sub>3</sub>)

Zinc oxide (ZnO)

b) Bronze ----- Copper and tin (Cu&Sn)

Solder ----- lead and tin (Pb & Sn)

|      |   |       |
|------|---|-------|
|      |   | 2     |
| XI   | <b><u>PART-C BIOLOGY</u></b>  | 2x1=2 |
|      | 27) c) Plankton, fish, crab, Shark  | 1     |
|      | 28) a) Water Storage  | 1     |
| XII  |   | 3x2=6 |
|      | 29) Ozone absorbs harmful ultraviolet radiations of the Sun. In this way, it protects all living beings on earth  | 1     |
|      | 30) Newspapers, tin cans  | 1     |
|      | 31) - It helps in storage of water.   | 1     |
|      | - It helps in hydropower generation.  | 1     |
| XIII |   |       |
|      | 32) - Diabetes mellitus   | 1     |
|      | - Insulin hormone   | 1     |
|      | 33)   |       |
|      |    | 2     |
| XIV  |   | 2x3=6 |
|      | 34) a) i) <b><u>Implantation</u></b> - Implantation is a process in which the embryo is embedded in the lining of the uterus where they continue to grow and develop organs to become foetus. | 1     |
|      | ii) <b><u>Placenta</u></b> - The embryo gets nutrition from the mother's blood with the help of a special tissue called Placenta.   | 1     |
|      | b) The development of the child inside the mother's body takes approximately nine months  | 1     |
|      | 35)   |       |
|      | a) In relative method, if we find the fossils closer to the surface are more recent than the fossils we find in deeper layers. Like this we estimate the age of fossils in relative method    | 1     |

|   | <p>b) Change in non-reproductive tissues cannot be passed on to the DNA of the germ cells. Therefore the experiences of an individual during its life time cannot be passed on to its progeny.</p> <p>c) All children will inherit an 'X' chromosome from their mother regardless of whether they are boys or girls. A child who inherits an 'X' Chromosome from her father will be a girl, and one who inherits a 'Y' chromosome from him will be a boy.</p> <p style="text-align: center;">OR</p> <p>a) Fossils are the remains or impressions of the dead animals and plants that lived in the past.</p> <p>b) Fossils are the direct evidences in support of organic evolution.</p> <p>c) Fossils help in determining evolutionary relationships between organisms.</p>  | <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> |              |   |   |   |
|---|--|---|--------------|---|---|---|
|   | <p>36)</p> <p>I) Green stemmed rose plant</p> <p>II) 25% or <math>\frac{1}{4}</math></p> <p>III) Ratio of GG and Gg in the F<sub>2</sub> progeny is</p> <p style="text-align: center;">GG : Gg<br/>1 : 2</p>   | <p>1</p> <p>1</p> <p>1</p>                            |              |   |   |   |
| XV  | <p>37)</p>   |   |              |   |   |   |
| XVI   | <p>38)</p> <p>a)</p> <p>i) Pepsin -- → Pepsin enzyme digest the protein</p> <p>ii) Hydrochloric acid -- → The Hydrochloric acid creates an acidic medium which facilitates the action of the enzyme pepsin</p> <p>iii) Villi -- → villi increases the surface area of absorption and helps in the absorption of nutrients.</p> <p>b)</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: center;"><u>ARTERIES</u></th> <th style="text-align: center;"><u>VEINS</u></th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>• Arteries carry blood away from the heart to Various organs of the body</li> <li>• Arteries have thick elastic walls.</li> <li>• Arteries do not have valves</li> <li>• Blood flows in high pressure</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>• Veins collect the blood from different organs and bring it back to the heart</li> <li>• Veins have thin walls</li> <li>• Veins have valves</li> <li>• Blood flows in low pressure</li> </ul> </td> </tr> </tbody> </table> | <u>ARTERIES</u>                                       | <u>VEINS</u> | <ul style="list-style-type: none"> <li>• Arteries carry blood away from the heart to Various organs of the body</li> <li>• Arteries have thick elastic walls.</li> <li>• Arteries do not have valves</li> <li>• Blood flows in high pressure</li> </ul> | <ul style="list-style-type: none"> <li>• Veins collect the blood from different organs and bring it back to the heart</li> <li>• Veins have thin walls</li> <li>• Veins have valves</li> <li>• Blood flows in low pressure</li> </ul> | <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> |
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| (any two)   |  |   |              |   |   |   |

## MODEL QUESTION PAPER-5

### PART-A PHYSICS

**I. Four alternatives are given for each of the following questions/ incomplete statements. choose the correct alternative and write the complete answer along with its letter of alphabet.**

**2x1=2**

1. The gas responsible for greenhouse effect is

A) carbon monoxide B) Nitrogen dioxide C) Sulphur dioxide D) carbon dioxide

2. what is the potential difference marked on all Indian electrical appliances.

A) 200v B) 220v C) 2200v D) 2000v

**II. Answer the following questions.**

**3x1=3**

3. The inner walls of a solar cooker are painted black, give reason.

4. A coil of insulated wire is connected to a galvanometer what would be seen if a bar magnet with its North Pole towards one face of the coil is



a. moved quickly towards the coil.

5. Name the important chemical constituent of the biogas.

**III Answer the following questions.**

**3x2=6**

6. Draw a neat diagram of resistor R1 R2 and R3 resistors connected in series with necessary connections.

**OR**

Draw a neat diagram of electric circuit used for studying ohm's law.

7. Draw the ray diagram to show the formation of image by a convex lens when the object is kept between 2 F1 and F1.

8. list some of the home appliances that make use of electric motors.

**IV. Answer the following questions.**

**3x3=9**

9. An object 4 cm in size is placed at 25 Cm in front of a concave mirror of focal length 15 Cm at what distance from the mirror should a screen be placed in order to obtain a sharp image. find the nature, size and magnification of the image . **OR**

A convex mirror used for rareview on an automobile has a radius of curvature of 3 m if a bus is located at 5 m from this mirror find the position nature and size of the image give reason .

10. Give reasons.

a. why is the colour of the Sun red at sunrise and sunset?

b. why are danger signal lights are red in colour?



c. why is the colour of the clear sky blue ?

**OR**

Give reasons.

- a. for the Dispersion of light .
- b. for the spectrum is not obtained in a glass slab.
- c. Rainbow is formed after the rain.

11. In the below type of coils explain the pattern of magnetic field lines formed.

- a. straight wire b. circular coil. c. solenoid.

**V. Answer the following questions.**

**2x4=8**

12.a. state Ohm's law?

- b. write the mathematical formula for Ohm's law .
- c. List the factors on which the resistance of a conductor depends upon?

d. write the mathematical formula for joules law.

13. a. Define refraction of light ?

- b. State laws of refraction?
- c. The refractive index of diamond is 2.42 what do you mean by this statement explain?

### **PART-B CHEMISTRY**

**VI. Four alternatives are given for each of the following questions/ incomplete statements. choose the correct alternative and write the complete answer along with its letter of alphabet.**

**2x1=2**

14. The balanced equation among the following

- A)  $2\text{Mg} + \text{O}_2 \rightarrow \text{MgO}$
- B)  $\text{Mg} + 2\text{O}_2 \rightarrow 2\text{MgO}$
- C)  $\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$
- D)  $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$

15. Find out the correct process that takes place when soap interact with water.



- A)
- B)
- C)
- D)

**VII. Answer the following questions**

**4x1=4**

16. State the Mendeleev's law of periodic table

17. Write the name and the molecular formula of the saturated hydrocarbon having general formula  $\text{C}_n\text{H}_{2n}$  and containing 3 carbon atom .

18. The home made chakli turns to rancidity within a few days, but the potato

chips bought from the shop, even though manufactured 2 months before will not have any smell, give scientific reason.

19. Why aluminium oxide is known as amphoteric oxide?

**VIII. Answer the following questions****3x2=6**

20. Draw the diagram to show the electrolysis of water.

21. Sample of four metals P, Q, R and S were taken and added to the following solution one by one. The result obtained has been tabulated as follows

| Metal | ZnSO <sub>4</sub> | Na <sub>2</sub> SO <sub>4</sub> | CaCl <sub>2</sub> |
|-------|-------------------|---------------------------------|-------------------|
| P     | Displacement      | Displacement                    | Displacement      |
| Q     | Displacement      | No reaction                     | No reaction       |
| R     | Displacement      | No reaction                     | No reaction       |
| S     | Displacement      | No reaction                     | No reaction       |

Use the table above to answer the following questions :

- Which is the most reactive metal?
- Arrange these metals in the order of decreasing reactivity.

22. Draw a neat diagram to show acid solution in water conducts electricity

**IX. Answer the following questions****3x3=9**

23. Write the important products obtained in the chlor-alkali process? Write the uses of each product.

**OR**i) Name the common name of CaOCl<sub>2</sub> compound. Write 2 uses of this compound.

ii) Why do acids not show acidic behaviour in the absence of water?

24. Answer the following question by observing part of periodic table given below

| Group→<br>Period↓ | 1 | 2 | 16 | 17 | 18 |
|-------------------|---|---|----|----|----|
| 1                 | X |   |    |    |    |
| 2                 |   | B | D  | C  |    |
| 3                 | M | E |    | L  |    |

- Which metal among these produces cations?
- Which element is having the highest atomic size and give reason for your answer.
- List the electro-negative elements in this periodic table.

25. i) Explain the ionic bond formed between Sodium and Chlorine.

ii) Ionic compounds have high melting and boiling points why?

**OR**

i) Write the difference between Calcination and Roasting.

ii) If one of the metals in the alloy is mercury, then what is the name of that alloy?

**X. Answer the following questions****1x4=4**

26. 'A' is a component of alcohol. If 'A' oxidises to give 'B' compound.

'B' is used for the preparation of pickles. 'B' compound reacts with 'A' to give aromatic 'C'. Write the above given chemical reactions, and find out A, B, C.

**XI. Four alternatives are given for each of the following questions/ incomplete statements. choose the correct alternative and write the complete answer along with its letter of alphabet.**

**3x1=3**

27. One of the below is best option for handling non-biodegradable waste

- A) Burning                      B) piling up                      C) recycling                      D) burying

28. which of the following 'biodiversity hotspot'

- A) rivers                      B) forests                      C) dessert                      D) ocean

29. pure-bred pea plant A is crossed with pure-bred pea plant B. It is found that the plants which look like A do not appear in F1 generation but seen in F2 generation .which of the plants A and B are tall or dwarf ?

- A) A are tall and B are dwarf                      B) A are tall and B are also tall  
C) A are dwarf and B are also dwarf                      D) A are dwarf and B are tall

**XII. Answer the following questions:**

**2x1=2**

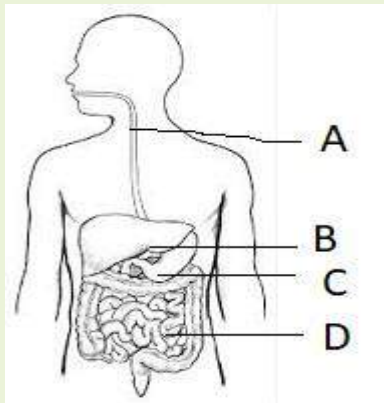
30. DDT and lead oxide are regarded as non biodegradable substances . Give reason .

31. Coal and petroleum resources has to be used judiciously. Why?

**XIII. Answer the following questions :**

**2x2=4**

32. In the diagram given below A ,B ,C , D represents different parts of digestive system. Referring the diagram answer the given questions ,



a) Identify and name the part which is responsible for the emulsification of fats and name the enzyme responsible for the emulsification of fats .

b) identify and name the part in which hydrochloric acid is released and mention the function of hydrochloric acid in digestion process.

33. a) why the plant cells grow longer when it detects light ?

b) In which part of the plant body cytokinin hormone concentration is more? **OR**

How adrenaline hormone helps the body to deal with emergency situations?

**XIV. Answer the following question:**

**3x3=9**

34. a) Multicellular organisms require more complex reproduction methods. Give reason .

b) In male reproductive system testis is located outside the abdominal cavity in scrotum. Give reason.

c) Mention the important feature of the organism responsible for the maintenance of body design .

35. a) What is meant by aerobic respiration and anaerobic respiration ?

b) How do you think the energy released during cellular respiration is utilized ?

c) Rate of breathing in aquatic organisms is much faster than that of terrestrial organisms. Why?

36.a) Large dams can be used to store water and also used to generate electricity .But environmentalists are against the construct large dams . Analyze and give proper reasons for the statement .

b) 'Mining is also a form of pollution' . justify your answer.

**XV. Answer the following question:**

**1x4=4**

37. Draw the neat diagram of brain and label the following parts:

a) cerebellum

b) medulla

**OR**

Draw neat labelled diagram of structure of neuron and answer the following questions:

a) where the information is acquired ?

b) where the information must be converted into a chemical signal for onward transmission .

**XVI. Answer the following question:**

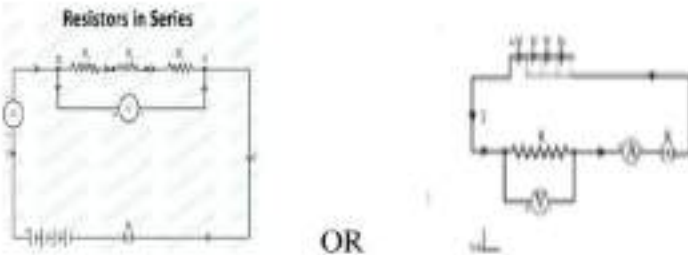
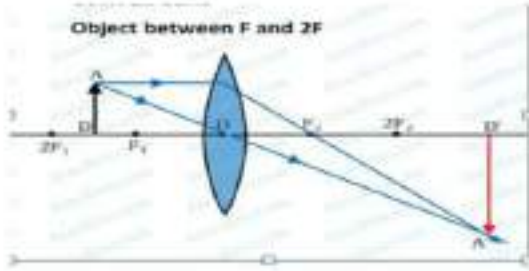
**1x5=5**

38. a) Explain how the organisms restore the normal number of chromosomes in the progeny ?

b) Mention the factors that led to the emergence of new species.

c) Mention the basic events in evolution .

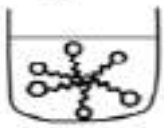
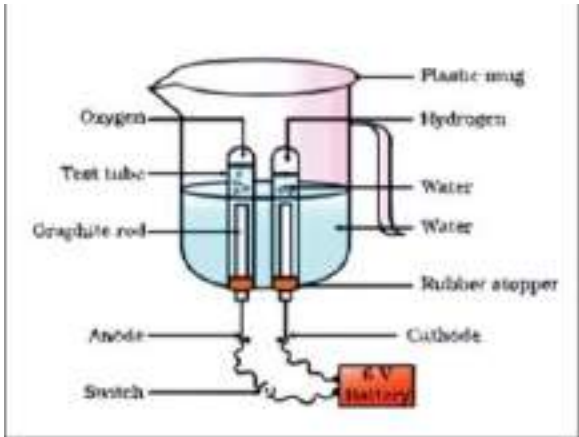
d) write the differences between homologous organs and analogous organs.

| Q.NO        | VALUE POINTS.   | MARKS         |
|-------------|---|---------------|
| <b>I.</b>   | <b>MCQ questions</b>  | <b>1X2=2.</b> |
| 1.          | d. Carbon dioxide   | 1             |
| 2.          | b. 220 v  | 1             |
| <b>II.</b>  | <b>Answer the following questions.</b>  | <b>1X3=3.</b> |
| 3.          | Because the black colour absorbs maximum heat energy from the sun.  | 1             |
| 4.          | There is an induced current that results in the deflection of the needle towards right in the galvanometer.   | 1             |
| 5.          | Methane about 75% and hydrogen.   | 1             |
| <b>III.</b> | <b>Answer the following questions.</b>  | <b>2X3=6.</b> |
| 6.          | <p style="text-align: center;"><b>Resistors in Series</b></p>  <p style="text-align: center;">OR</p> | 2             |
| 7.          | <p style="text-align: center;"><b>Object between F and 2F</b></p>                                   | 2             |
| 8.          | Mixie, washing machine, fan, water pump etc.  | 2             |
| <b>IV</b>   | <b>Answer the following questions.</b>  | <b>3X3=9.</b> |
| 9.          | h=4 cm  |               |

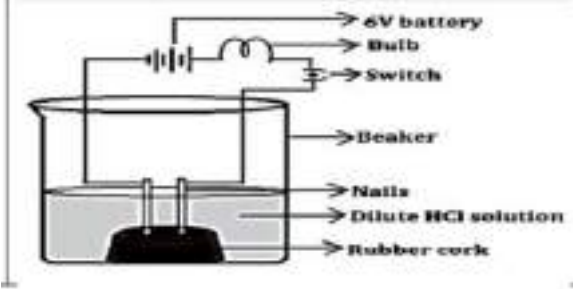
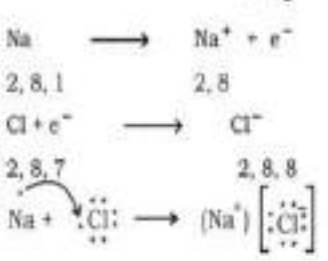


|           |  |        |
|-----------|--|--------|
|           | <p>a. different colours have different wavelength and during refraction every colour of light bend through its own angle with respect to the incident ray. 1</p> <p>b. because glass slab is made up of two glass prisms. one prism placed erect and the other prism placed inverted .one prism disperses the light and the other one emerges the white light . 1</p> <p>c. because it is caused by Dispersion of Sunlight by tiny water droplets which acts like a small prism and results in the formation of a rainbow after rain . 1</p>   |        |
| 11.       | <p>a. pattern of magnetic field lines are concentric circles. 1</p> <p>b. at every point in a circular coil it is concentric circle and at the centre it is straight line. 1</p> <p>c. outside the solenoid the lines of forces are as in bar magnet where as inside the lines of forces are parallel to each other. 1</p>   |        |
| <b>V.</b> | <b>Answer the following questions. 2X4=8.</b>  |        |
| 12.       | <p>a. The current flowing in a metallic wire and the potential difference across its terminal in an electric circuit is directly proportional to the current flowing through it provided its temperature remains the same. 1</p> <p>b. <math>V/I = \text{constant}</math> <math>V/I = R</math> 1</p> <p>c. *length of conductor<br/>* area of cross section<br/>* material of conductor.<br/>*Temperature. 1</p> <p>d. <math>H = I^2 RT</math>. 1</p>  | 3<br>4 |
| 13.       | <p>a. An oblique Ray of light when it passes from one medium to the other it changes its path is known as refraction of light . 1</p> <p>b. *The incident ray ,the refracted ray and the normal to the interface of two transparent media at the point of incidence all lie in the same plane. 1</p> <p>* the ratio of Sine of angle of incidence to the sine of angle of refraction is constant for the light of a given colour and for the given pair of media. 1</p> <p>c. It means that the velocity of light in diamond is 2.42 times lesser than the speed of light in vacuum. 1</p> | 4      |

**CHEMISTRY  
PART-B**

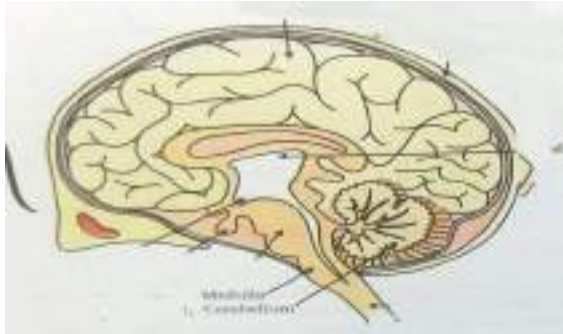
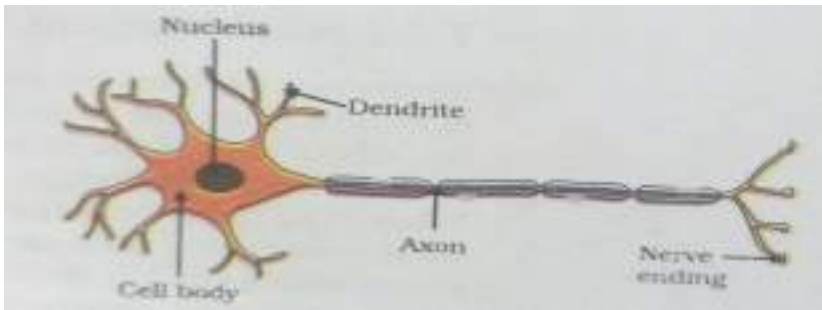
| Qn Nos       | Value Points  | Total        |
|--------------|---|--------------|
| <b>VI.</b>   | <b>Multiple choice questions:</b>   | <b>2x1=2</b> |
| 14.          | <b>Ans:</b><br>(D) $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$  | 1            |
| 15.          | <b>Ans:</b><br><br>(D)                             | 1            |
| <b>VII.</b>  | <b>Answer the following questions :</b>   | <b>4x1=4</b> |
| 16.          | <b>Ans:</b><br>The properties of the elements are the periodic function of their atomic mass.                                       | 1            |
| 17.          | <b>Ans:</b> Cyclo propane $\text{C}_3\text{H}_6$  | 1            |
| 18.          | <b>Ans:</b><br>Because chips bags are flushed with gas such as nitrogen as anti oxident to prevent the chips from getting oxidised. | 1            |
| 19.          | <b>Ans:</b><br>Because it reacts with acids and bases to form salt and water.   | 1            |
| <b>VIII.</b> | <b>Answer the following questions.</b>  | <b>3x2=6</b> |
| 20           |    | 2            |



| Qn Nos     | Value Points   | Total                               |
|------------|--|-------------------------------------|
| 21.        | <b>Ans:</b><br>i) Most active element P<br>ii) S>R>Q>P   | 1                                   |
| 22.        |   | 1<br>1<br>2                         |
| <b>IX.</b> | <b>Answer the following questions</b> <span style="float: right;"><b>3x3=9</b></span>  |                                     |
| 23.        | <b>Ans:</b><br>Products of Chlor- alkali process<br>i) Chlorine: Water treatment/Swimming pool<br>ii) Hydrogen: Fuels/Margarine<br>iii) Sodium Hydroxide: De-greasing metals/Soaps and detergents<br>OR<br>i) Bleaching powder. <ul style="list-style-type: none"> <li>• Used for disinfection of drinking water.</li> <li>• Used for bleaching wood pulp in the paper manufacturing industry.</li> </ul> ii) Because water being a polar solvent assists in the dissociation of acids into their respective ions. | 1<br>1<br>1<br>1<br>1/2<br>1/2<br>1 |
| 24.        | <b>Ans:</b><br>i) X and M<br>ii) M, because atomic size decreases along the period and increases along the group.<br>iii) D, C, L are electronegative.   | 1<br>1<br>1                         |
| 25.        | <b>Ans:</b><br>i) Electronic configuration of Sodium is (2,8,1) Electronic configuration of Chlorine is (2,8,7)  | 1                                   |
|            |   | 1<br>1                              |

| Qn Nos   | Value Points  | Total   |             |  |                                      |  |   |   |
|--|---|---|-------------|--|--------------------------------------|--|---|---|
|  | <p>ii) Because a considerable amount of energy is required to break the strong inter-ionic attraction.</p> <p style="text-align: center;">OR</p> <p>Ans:</p> <p>i)</p> <table border="1" data-bbox="386 594 1365 783"> <tr> <td>Roasting</td> <td>Calcination</td> </tr> <tr> <td>Heating ores strongly in the presence of excess air.</td> <td>Heating ores strongly in limited air</td> </tr> <tr> <td>Sulphur ores are converted into oxides</td> <td>Carbonates ores are changed into oxides</td> </tr> </table> <p>ii) Amlgam</p>  | Roasting  | Calcination | Heating ores strongly in the presence of excess air. | Heating ores strongly in limited air | Sulphur ores are converted into oxides | Carbonates ores are changed into oxides | <p style="text-align: right;">1</p> <p style="text-align: right;">1</p> <p style="text-align: right;">1</p> <p style="text-align: right;">1</p> |
| Roasting   | Calcination   |   |             |  |                                      |  |   |   |
| Heating ores strongly in the presence of excess air. | Heating ores strongly in limited air  |   |             |  |                                      |  |   |   |
| Sulphur ores are converted into oxides               | Carbonates ores are changed into oxides   |   |             |  |                                      |  |   |   |
| X  | <p><b>Answer the following questions</b> <span style="float: right;"><b>1x4=4</b></span></p> <p>Ans:</p> <p>A <math>\xrightarrow{\text{oxidise}}</math> B</p> <p>A+B <math>\rightarrow</math> C</p> <p><math>\text{C}_2\text{H}_5\text{OH} \rightarrow \text{CH}_3\text{COOH}</math></p> <p style="text-align: center;">(A) <span style="margin-left: 100px;">(B)</span></p> <p><math>\text{C}_2\text{H}_5\text{OH} + \text{CH}_3\text{COOH} \rightarrow \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}</math></p> <p style="text-align: center;">(A) <span style="margin-left: 50px;">(B)</span> <span style="margin-left: 100px;">(C)</span></p> <p>‘A’= Ethanol<br/> ‘B’=Ethanoic acid<br/> ‘C’=Ethyl acetate</p> | <p style="text-align: right;">1</p> <p style="text-align: right;">1</p> <p style="text-align: right;">1</p> <p style="text-align: right;">1</p> <p style="text-align: right;">1</p> |             |  |                                      |  |   |   |



|   |  |  |
|---|--|--|
| <p>35</p> <p>36</p> <p>XV</p> <p>37</p> | <p>c) The consistency of DNA copying during reproduction . 1</p> <p>a) Type of respiration which takes place by the presence of oxygen and releases carbon dioxide and water is called aerobic respiration 1<br/> Type of respiration which takes place in the absence of oxygen and releases ethanol and carbon dioxide is called anaerobic respiration. 1</p> <p>b) Energy released during cellular respiration is utilized in the form of ATP. 1</p> <p>c) since amount of dissolved oxygen is fairly low in water, aquatic organisms breathing rate is much faster than that of terrestrial organisms.</p> <p>a) environmentalists are against the construct large dams because it address three problems :</p> <ol style="list-style-type: none"> <li>i. Social problems : displacing large number of peasants and tribals without adequate compensation or rehabilitation.</li> <li>ii. Economic problem: swallowing up huge amounts of public money without the generation of proportionate benefits.</li> <li>iii. Environmental problems: large dams leads to enormous deforestation and loss of biological diversity. (Any 2) 1+1</li> </ol> <p>b) mining causes pollution because of the large amount of slag which is discarded during metal extraction. 1</p> <p><b>Answer the following questions:</b></p> <div style="text-align: center;">  <p>OR</p>  </div> <p>a) Dendrite 1<br/> b) Nerve ending 1</p> | <p>3</p> <p>3</p> <p>3</p> <p>1x4=4</p> <p>4</p> <p>4</p> <p>2</p> <p>1</p> <p>1</p> |
|---|--|--|

**XVI**  
38

**Answer the following questions:**

38. a) Each cell will have one chromosome from maternal or paternal origin .When germ cells combine ,they will restore the normal number of chromosomes in the progeny. 1

b) Flow of genes , natural selection and genetical drift. 1

c) The changes that takes place in DNA during reproduction is the basic event of evolution. 1

d) 1+1

| Homologous organs  | Analogous organs   |
|--|--|
| i. Organs which are inherited from a common ancestor but performs different functions are homologous organs. | i. Organs which have different origin but perform similar function are analogous organs. |
| ii. Example : forelimbs of birds and humans  | ii. wings of bats and birds  |

**1x5=5**

5