INSTRUCTIONS TO CANDIDATES

1. Candidates should write their Hall Ticket Number only in the space provided at the top left hand corner of this page and also in the space provided on the OMR Response Sheet. **BESIDES WRITING, THE CANDIDATE SHOULD ENSURE THAT THE APPROPRIATE CIRCLES PROVIDED FOR THE HALL TICKET NUMBERS ARE SHADED USING BALL POINT PEN (BLUE/BLACK) ONLY ON THE OMR RESPONSE SHEET. DO NOT WRITE HALL TICKET NUMBER ANYWHERE ELSE.**
2. Immediately on opening this Question Paper Booklet, check :
   (a) Whether **200** multiple choice questions are printed (**50** questions in Mathematics, **25** questions in Physics, **25** questions in Chemistry and **100** questions in Engineering)
   (b) In case of any discrepancy immediately exchange the Question Paper Booklet of same code by bringing the error to the notice of invigilator.
3. Use of Calculators, Mathematical Tables and Log books is not permitted.
4. **Candidate must ensure that he/she has received the Correct Question Booklet, corresponding to his/her branch of Engineering.**
5. **Candidate should ensure that the Booklet Code and the Booklet Serial Number, as it appears on this page is entered at the appropriate place on the OMR Response Sheet by shading the appropriate circles provided therein using Ball Point Pen (Blue/Black) only. Candidate should note that if they fail to enter the Booklet Serial Number and the Booklet Code on the OMR Response Sheet, their Answer Sheet will not be valued.**
6. **Candidate shall shade one of the circles 1, 2, 3 or 4 for corresponding question on the OMR Response Sheet using Ball Point Pen (Blue/Black) only. Candidate should note that their OMR Response Sheet will be invalidated if the circles against the question are shaded using pencil or if more than one circle is shaded against any question.**
7. One mark will be awarded for every correct answer. **There are no negative marks.**
8. The OMR Response Sheet will not be valued if the candidate :
   (a) Writes the Hall Ticket Number in any part of the OMR Response Sheet except in the space provided for the purpose.
   (b) Writes any irrelevant matter including religious symbols, words, prayers or any communication whatsoever in any part of the OMR Response Sheet.
   (c) Adopts any other malpractice.
9. Rough work should be done only in the space provided in the Question Paper Booklet.
10. No loose sheets or papers will be allowed in the examination hall.
11. Timings of Test : **10.00 A.M. to 1.00 P.M.**
12. Candidate should ensure that he / she enters his / her name and appends signature on the Question paper booklet and also on the OMR Response Sheet in the space provided. Candidate should ensure that the invigilator puts his signature on this question paper booklet and also on the OMR Response Sheet.
13. Before leaving the examination hall candidate should **return the OMR Response Sheet** to the invigilator. Failure to return the above shall be construed as malpractice in the examination. **Question paper booklet may be retained by the candidate.**
14. This booklet contains a total of **24** pages including Cover page and the pages for Rough Work.

Set Code : M2 Booklet Code : D

*Note : (1) Answer **all** questions.*
*(2) Each question carries **1** mark. There are no negative marks.*
*(3) Answer to the questions must be entered only on OMR Response Sheet provided separately by completely shading with **Ball Point Pen (Blue/Black)**, only one of the circles 1, 2, 3 or 4 provided against each question and which is most appropriate to the question.*
(4) The OMR Response Sheet will be invalidated if the circle is shaded using pencil or if more than one circle is shaded against each question.

MATHEMATICS

1. The rate of change of area of a circle with respect to radius when $r = 5$cm is
(1) 2π *sq.cm/sec* (2) 10π *sq.cm/sec*
(3) 100π *sq.cm/sec* (4) 20π *sq.cm/sec*

2. The function $\frac{\log x}{x}$ attains its maximum value at $x =$
(1) 0 (2) $\sqrt{e}$ (3) e (4) $\frac{1}{e}$

3. If the increase in the side of a square is 2%, then the approximate percentage increase in the area of the square is
(1) 2 (2) 4 (3) 6 (4) 8

4. If $u = \log\left(\frac{x^2}{y}\right)$ then $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} =$
(1) $2u$ (2) $3u$ (3) u (4) 1

5. $\int \text{cosec}^5\theta \cot\theta d\theta =$
(1) $\frac{\cot^2\theta}{2}$ (2) $\frac{-\text{cosec}^5\theta}{5}$ (3) $\frac{\text{cosec}^6\theta}{6}$ (4) $\frac{-\text{cosec}^6\theta}{6}$

6. $\int_2^3 \frac{dx}{x^2 - x} =$
(1) $\log\frac{2}{3}$ (2) $\log\frac{4}{3}$ (3) $\log\frac{8}{3}$ (4) $\log\frac{1}{4}$

7. The value of $\int_{\frac{\pi}{2}}^{\frac{\pi}{2}} \sin|x|dx =$
(1) 0 (2) $2\sin x$ (3) 2 (4) 1

8. $\int_0^1 x\tan^{-1}x\,dx =$

(1) $\frac{\pi}{4}-\frac{1}{2}$ (2) $\frac{\pi}{8}-\frac{1}{2}$ (3) $\frac{\pi}{4}+\frac{1}{2}$ (4) $\frac{\pi}{8}+\frac{1}{2}$

9. $\lim_{n\to\infty}\sum_{r=0}^{n}\frac{n}{n^2+r^2} =$

(1) $\frac{\pi}{2}$ (2) $\frac{\pi}{3}$ (3) $\frac{\pi}{4}$ (4) $\frac{\pi}{8}$

10. $\int_0^{\pi/4}\sec^6 x\,dx =$

(1) $\frac{8}{3}$ (2) $\frac{28}{15}$ (3) $-\frac{28}{15}$ (4) $\frac{4}{5}$

11. The area bounded by the y-axis and $x=4-y^2$ is _____square units.

(1) $\frac{3}{32}$ (2) $\frac{32}{3}$ (3) $\frac{33}{2}$ (4) $\frac{9}{2}$

12. The volume of the solid generated by rotating one arch of the curve $y = \sin 3x$ about the x-axis is ----

(1) π^2 (2) $\frac{\pi^2}{2}$ (3) $\frac{\pi^2}{4}$ (4) $\frac{\pi^2}{6}$

13. The differential equations of the family of circles touching y-axis at the origin is

(1) $y^2-x^2-2xyy'=0$ (2) $(x^2-y^2)y'-2xy=0$

(3) $yy'+y^2=x^2$ (4) $2yy'-y^2=x^2$

14. The solution of the differential equation $ydx-2xdy=0$ represents a family of

(1) straight lines (2) parabolas (3) circles (4) catenaries

15. If $y=x$ is a solution of $x^2y''+xy'-y=0$ then the second linearly independent solution of the equation is

(1) x^2 (2) $\frac{1}{x}$ (3) $\frac{1}{x^2}$ (4) x^n

16. Which of the following is an integrating factor of $\frac{dy}{dx}(x+y+1)=1$?

(1) e^x (2) e^y (3) e^{-x} (4) e^{-y}

17. The differential equation whose solution is Ax^2+By^2, where A, B are arbitrary constants is of

(1) 1st order and 1st degree (2) 2nd order and1st degree

(3) 2nd order and 2nd degree (4) 1st order and 2nd degree

18. The general solution of the differential equation $\frac{d^2x}{dt^2} - 4\frac{dx}{dt} + 5x = 0$ is

(1) $x = (c_1 \cos t + c_2 \sin t)e^{2t}$ (2) $t = (c_1 \cos x + c_2 \sin x)e^{2x}$

(3) $x = (c_1 \cos 2t + c_2 \sin 2t)e^{t}$ (4) $t = (c_1 \cos 2x + c_2 \sin 2x)e^{x}$

19. The particular integral of $\frac{d^2y}{dx^2} - y = \cosh x$ is

(1) $\frac{x \sinh x}{4}$ (2) $\frac{x \sinh x}{2}$ (3) $\frac{x(xe^x - e^{-x})}{4}$ (4) $\frac{x \cosh x}{4}$

20. If $x \neq 0$ and $\begin{vmatrix} 1 & x & 2x \\ 1 & 3x & 5x \\ 1 & 3 & 4 \end{vmatrix} = 0$, then $x =$

(1) 1 (2) -1 (3) 2 (4) -2

21. If $A = \begin{bmatrix} x & 1 \\ 1 & 0 \end{bmatrix}$ is an involutory matrix then $x =$

(1) 0 (2) 2 (3) -1 (4) 2

22. The equations $x + 2y + 3z = 1$, $2x + y + 3z = 2$, $4x + 5y + 9z = 4$ have

(1) a unique solution (2) no solution

(3) infinite number of solutions (4) two solutions

23. If A is a 2×2 matrix and $\det(2A) = k \det(A)$ then $k =$

(1) 2 (2) 4 (3) 6 (4) 8

24. If A, B are two matrices and $AB=B$, $BA=A$ then $A^2 + B^2 =$

(1) $A+B$ (2) $A-B$ (3) AB (4) 0

25. If $\frac{(x+1)^2}{x^3 + x} = \frac{A}{x} + \frac{Bx + C}{x^2 + 1}$ then $\sin^{-1}\left(\frac{A}{C}\right) =$

(1) $\frac{\pi}{6}$ (2) $\frac{\pi}{4}$ (3) $\frac{\pi}{3}$ (4) $\frac{\pi}{2}$

26. If $\frac{x^2 + 5}{(x^2 + 2)^2} = \frac{1}{x^2 + 2} + \frac{K}{(x^2 + 2)^2}$ then $K =$

(1) 1 (2) 2 (3) 3 (4) 4

27. The value of $\cos 105° =$

(1) $\frac{1 - \sqrt{3}}{2\sqrt{2}}$ (2) $\frac{\sqrt{3} + 1}{2\sqrt{2}}$ (3) $\frac{\sqrt{3} + 1}{2}$ (4) $2 + \sqrt{3}$

28. If $a\sin^2\theta + b\cos^2\theta = c$ then $\tan^2\theta =$

(1) $\frac{b-c}{a-c}$ (2) $\frac{a-c}{b-c}$ (3) $\frac{c-b}{a-c}$ (4) $\frac{a-c}{c-b}$

29. The value of $6\sin 20° - 8\sin^3 20° =$

(1) 2 (2) $\frac{1}{\sqrt{2}}$ (3) $\sqrt{3}$ (4) $\frac{1}{\sqrt{3}}$

30. If $\sin\theta + \operatorname{cosec}\theta = 2$ then the value of $\sin^6\theta + \operatorname{cosec}^6\theta =$

(1) 0 (2) 50 (3) 1 (4) 2

31. The sine function with period 3 is

(1) $\sin\frac{2\pi x}{3}$ (2) $\sin\frac{\pi x}{3}$ (3) $\sin 3\pi x$ (4) $\sin\frac{3\pi x}{2}$

32. The maximum value of $3\sin^2 x + 5\cos^2 x$ is

(1) 8 (2) 3 (3) 5 (4) 34

33. The smallest value of θ satisfying $\sqrt{3}(\tan\theta + \cot\theta) = 4$ is

(1) $\frac{2\pi}{3}$ (2) $\frac{\pi}{3}$ (3) $\frac{\pi}{6}$ (4) $\frac{\pi}{12}$

34. The value of $\cos\left[\sin^{-1}\left(\frac{3}{5}\right) + \sin^{-1}\left(\frac{5}{13}\right)\right] =$

(1) $\frac{33}{25}$ (2) $\frac{33}{65}$ (3) $\frac{25}{33}$ (4) $\frac{56}{65}$

35. The value of $\sin\theta + \sin(\theta + 120°) - \sin(120° - \theta) =$

(1) 0 (2) $\sin\theta$ (3) 1 (4) $-\sin\theta$

36. The principal solution of 3cosecA = 4sinA is

(1) $\frac{\pi}{4}$ (2) $\pm\frac{\pi}{3}$ (3) $\pm\frac{\pi}{6}$ (4) $\pm 2\pi$

37. The complex number z satisfying the equation $z^2 + \bar{z}^2 = 2$ forms

(1) a straight line (2) a circle (3) a parabola (4) a hyperbola

38. The value of $(1-i)^8$ is

(1) 4 (2) 8 (3) 16 (4) 256

39. The intercept on x-axis made by the circle $3x^2 + 3y^2 - 6x + 13y + 5 = 0$ is

(1) 4 (2) 3 (3) 6 (4) 2

40. The equation of the parabola with vertex $(-2, 3)$ and focus $(1, 3)$ is

(1) $y^2+6y+12x-15=0$ (2) $y^2-6y-12x-15=0$

(3) $x^2-6x-12y-15=0$ (4) $y^2-6y-3x+15=0$

41. The latus rectum of the ellipse $x^2+2y^2=3$ is

(1) 2 (2) $\sqrt{3}$ (3) $2\sqrt{6}$ (4) $2\sqrt{3}$

42. The eccentricity of the hyperbola $4x^2-9y^2=2ax+b^2$ is

(1) $\frac{a}{b}$ (2) $\frac{\sqrt{b}}{a}$ (3) $\frac{\sqrt{13}}{2}$ (4) $\frac{13}{\sqrt{3}}$

43. The length of the diameter of the circle $x^2+y^2-6x-8y=0$ is

(1) 10 (2) 15 (3) 5 (4) 20

44. If the line $2y=5x+k$ touches the parabola $y^2=6x$, then $k=$

(1) $\frac{2}{3}$ (2) $\frac{4}{3}$ (3) $\frac{3}{5}$ (4) $\frac{6}{5}$

45. $\lim_{x\to 1}\frac{x^2-1}{|x-1|}=$

(1) 1 (2) -1 (3) 2 (4) -2

46. $\lim_{x\to 0}\frac{\log(x+2)}{2^x-1}=$

(1) $\log_e 4$ (2) $\log_2 e$ (3) $\log_e 2$ (4) $\log_4 e$

47. If $x=t^2, y=t^3$ then $\frac{d^2y}{dx^2}=$

(1) $\frac{3}{2}$ (2) $\frac{3t}{4}$ (3) $\frac{3}{4t}$ (4) $\frac{3}{2t}$

48. If $x^3+y^3=3axy$ then $\frac{dy}{dx}=$

(1) $\frac{x^2-ay}{ax-y^2}$ (2) $\frac{x^2+ay}{ay-x^2}$ (3) $\frac{y^2-ax}{x^2-ay^2}$ (4) $\frac{x^2+ay}{ax+y^2}$

49. If $y=\sin^{-1}\left(\frac{1-x^2}{1+x^2}\right)$ then $\frac{dy}{dx}=$

(1) $-\frac{2}{1+x^2}$ (2) $\frac{2}{1+x^2}$ (3) $\frac{1}{1+x^2}$ (4) $-\frac{1}{1+x^2}$

50. The slope of the normal to the curve $xy^2=4$ at $(1, -2)$ is

(1) 2 (2) -1 (3) $-\frac{1}{2}$ (4) 1

PHYSICS

51. The molecular kinetic energy of 1 gram of Helium at 127 °C is
(Assume Molecular weight of Helium = 4, R = 8.31 J.mol^{-1}.K^{-1})
(1) 130 J (2) 1247 J (3) 2471 J (4) 2147 J

52. 1 gm of steam is sent into 1 gm of ice. The resultant temperature of the mixture is
(1) 270 °C (2) 230 °C (3) 100 °C (4) 50 °C

53. Heat energy of 2100 J is given to a gas at a constant pressure 1.05×10^5 Pa, changing its volume to 5×10^{-3} m^3. The increase in its internal energy is
(1) 157 J (2) 175 J (3) 1575 J (4) 575 J

54. The unit of water equivalent is
(1) calorie (2) dyne (3) gram (4) erg

55. The potential difference that should be applied to stop the fastest photoelectrons emitted by nickel surface under the action of 20 nm uv radiations is
($h = 6.63 \times 10^{-34}$ J.s.; $c = 3 \times 10^8$ ms^{-1}; work function of Nickel is 5.01 eV)
(1) 5.714 eV (2) 571.4 eV (3) 0.5714 eV (4) 57.14 V

56. The critical current which can flow through a long thin superconducting wire of diameter 10^{-3}m is
($H_c = 7.9 \times 10^5$ A.m^{-1})
(1) 24.81 A (2) 2.481 A (3) 2.481 mA (4) 24.81 mA

57. The SI unit of energy is J = kgm^2.s^{-2}, that of speed 'v' is m.s^{-1} and of accelaration 'a' is m.s^{-2}. If 'm' represents the mass of the body, which of the following tells the correct answer for kinetic energy with respect to dimensional formula
(1) $K = m^2v^2$ (2) $K = ma$ (3) $K = \frac{1}{2}mv^2$ (4) $K = \frac{1}{2}m^2v^4$

58. With respect to the suitable conversion units, the values of the following blanks respectively are
1 kg.m^2.s^{-2} = _____ g.cm^2.s^{-2}; 3.0 m.s^{-2} = _____ km.h^{-2}
(1) 10^7; 3.88×10^4 (2) 10^5; 3.88×10^5
(3) 10^4; 3.88×10^7 (4) 10^5; 3.88×10^7

59. The position of an object moving along x – axis is given by $x = a + bt^2$. Here a = 8.5 m, $b = 2.5\ ms^{-2}$. Then the average velocity between t = 2.0 s and t = 4.0 s is
(1) $150\ m.s^{-1}$ (2) $100\ m.s^{-1}$ (3) $15\ m.s^{-1}$ (4) $1.5\ m.s^{-1}$

60. If $A = 4\hat{i} + 3\hat{k} - 5\hat{j}$, $B = 2\hat{i} - 10\hat{j} - 7\hat{k}$ and $C = 5\hat{i} + 7\hat{j} - 4\hat{k}$, the value of $(A \times B) \times C$ is
(1) $7\hat{i} + 10\hat{j} + 25\hat{k}$ (2) $4\hat{i} + 11\hat{j} + 28\hat{k}$
(3) $74\hat{i} + 10\hat{j} + 28\hat{k}$ (4) $74\hat{i} + 110\hat{j} + 285\hat{k}$

61. A body moving with uniform accelaration covers a distance of 19 m in its third second and 43 m in its seventh second of its motion. The initial velocity and accelaration of the body respectively are
(1) $4\ m.s^{-1}$; $6\ m.s^{-2}$ (2) $6\ m.s^{-1}$; $4\ m.s^{-2}$
(3) $8\ m.s^{-1}$; $6\ m.s^{-2}$ (4) $4\ m.s^{-1}$; $12\ m.s^{-2}$

62. A body is at rest on the tip of a smooth inclined plane of length 15 m and angle of inclination 60° with the horizontal. Neglecting the frictional forces, the time taken for the body to reach the bottom of the inclined plane is (Assume $g = 9.8\ m.s^{-2}$)
(1) 18.8 s (2) 1.88 s (3) 0.18 s (4) 0.018 s

63. A body is projected upwards with a velocity of $14.7\ ms^{-1}$ from ground. The time taken for the body to reach the ground is (Assume $g = 9.8\ ms^{-2}$)
(1) 5 s (2) 2 s (3) 3 s (4) 4 s

64. A ball projected upwards with an initial velocity of $40\ m.s^{-1}$, reaches a maximum height of 25 m. The horizontal distance covered by the ball when it touches the ground is (Assume $g = 9.8\ m.s^{-2}$)
(1) 100m (2) 50m (3) 150.5m (4) 15.5m

65. An aeroplane is flying horizontally at an altitude of 49 m with a velocity of $200\ m.s^{-1}$. When it is just above the target a bomb is dropped. The bomb touches the ground missing the target at a horizontal distance of (Assume $g = 9.8\ m.s^{-2}$)
(1) 632.4 m (2) 63.24 m (3) 6.324 m (4) 0.6324 m

66. A force of 100N is acted on a body of mass 20.0 kg placed on a rough horizontal surface. If the direction of the force is parallel to the surface and the coefficient of friction is 0.4, the accelaration produced is
(1) $10.8\ ms^{-2}$ (2) $0.108\ ms^{-2}$ (3) $1.08\ ms^{-2}$ (4) $108\ ms^{-2}$

67. A man carries a load of 50 kg through a height of 40 m in 25s. If the power of the man is 1568W, his mass is (Assume $g = 9.8\ m.s^{-2}$)
(1) 150 kg (2) 75 kg (3) 50 kg (4) 100 kg

68. A 5 kg mass is dropped from a height. The kinetic energy of the mass at the end of third second of its travel is (Assume $g = 9.8\ m.s^{-2}$)

(1) 2161 J (2) 21.61 J (3) 2.161 J (4) 0.2161 J

69. Which of the following law is called the law of inertia ?

(1) Newton's second law (2) Newton's first law

(3) Newton's third law (4) Conservation law

70. The frequency of a body executing simple harmonic motion is 6 Hz, with an amplitude 0.2 m. The maximum velocity and accelaration of the body are respectively given by

(1) $7.54\ ms^{-1}$; $284.2\ ms^{-2}$ (2) $284.2\ ms^{-1}$; $7.54\ ms^{-2}$

(3) $75.4\ ms^{-1}$; $284.2\ ms^{-2}$ (4) $7.54\ ms^{-1}$; $28.42\ ms^{-2}$

71. A pendulum of length 80 cm has the time period of 1.8s at a place. If the period were to be 1.6s at the same place, the length of the pendulum is

(1) 63.2 m (2) 0.632 m (3) 0.0632 m (4) 6.32 m

72. If the length of a second's pendulum is halved, its period of oscillations will be

(1) 14 s (2) 0.14 s (3) 1.414 s (4) 14.14 s

73. A pipe of 30 cm long is open at both ends. The harmonic mode of the pipe that resonates a 1.1 kHz source is (Speed of sound in air is $330\ ms^{-1}$)

(1) First Harmonic (2) Third Harmonic

(3) Second Harmonic (4) Fourth Harmonic

74. A train standing at the outer signal of a railway station blows a whistle of frequency 400 Hz in still air. The frequency of the whistle for an observer on the platform when the train approaches him at a speed of $10\ ms^{-1}$ is

(1) 412 Hz (2) 41.2 Hz (3) 4.12 Hz (4) 400 Hz

75. Two thermally insulated vessels of volumes V_1 and V_2 are joined with a valve and filled with air at temperatures T_1 and T_2 at pressures P_1 and P_2, respectively. If the valves joining the two vessels are opened, the temperature inside the vessels at equilibrium is

(1) $\dfrac{(P_1V_1 + P_2V_2)\,T_1T_2}{(P_1V_1T_2 + P_2V_2T_1)}$ (2) $\dfrac{P_1V_1 + P_2V_2}{(T_1T_2)(P_1V_1T_1 + P_2V_2T_2)}$

(3) $\dfrac{P_1V_1T_1 + P_2V_2T_2}{P_1 + P_2}$ (4) $\dfrac{P_1V_1}{P_2V_2}\left(\dfrac{T_1}{T_2}\right)$

CHEMISTRY

76. The type of polymerization reaction while forming polyvinylchloride from vinyl chloride is
(1) Addition polymerization (2) Condensation polymerization
(3) Ionisation (4) Decomposition

77. Which among the below is an example of thermosetting polymer ?
(1) Bakelite (2) Polyethelene (3) Teflon (4) polyvinyl chloride

78. The chemical used in vulcanization process to make rubber hard is
(1) Salt (2) Chloride (3) Sulphur (4) Ethyl acetate

79. Biogas is generated when an organic compound is subjected to
(1) Esterification (2) Aerobic decomposition
(3) Anaerobic decomposition (4) Distillation

80. The effect of using chlorofluorocarbons on environment is
(1) Acid rain (2) Ozone depletion
(3) BOD (4) Sound pollution

81. Dissolved oxygen content in water is expressed in
(1) kg (2) mg (3) ppm (4) L

82. The maximum number of electrons which can occupy 2s orbital is
(1) 1 (2) 2 (3) 3 (4) 4

83. The electronic configuration of carbon is
(1) $ls^2 2s^2 2p^1$ (2) $1s^2 2s^2 2p^2$ (3) $ls^2 2s^2 2p^3$ (4) $1s^2 2s^2 2p^4$

84. The shape of s orbital is
(1) Dumb-bells (2) Triangle (3) Spherical (4) Double dumbbell

85. The type of Chemical bond present in Sodium chloride is
(1) Covalent bond (2) Polar Covalent bond
(3) Polar bond (4) Ionic bond

86. Which of the following compound has covalent bond ?
(1) NaCl (2) HCl (3) H_2O (4) H_2

87. Which solvent is also called universal solvent
(1) Ethyl acetate (2) Methanol (3) Water (4) Dichloromethane

88. One molar solution of sodium hydroxide is prepared by adding
(1) 4g/L (2) 0.4g/L (3) 0.04g/L (4) 40g/L

89. A solution is a mixture of
(1) Two solutes (2) Two solids
(3) Single Solvent (4) Solute & Solvent

90. The pH of neutral solution is
(1) 2.0 (2) 7.0 (3) 3.0 (4) 5.0

91. According to Lewis theory, acid species will
(1) Donate electrons (2) Accept electrons
(3) Accept proton (4) Donate proton

92. Which of the following is a good conductor ?
(1) De-ionized water (2) Copper
(3) Teflon (4) Bakelite

93. In galvanic cell chemical energy is converted to
(1) Electrical energy (2) Thermal energy
(3) Sound energy (4) Water

94. According to Faraday's first law, the mass of any substance deposited or liberated at electrode is directly proportional to
(1) Quantity of Electricity passed (2) Temperature of Electrode
(3) Electrode potential (4) Solution concentration

95. In a given galvanic cell the standard reduction potential of Zinc electrode is –0.76 V and that of Copper electrode is –0.40 V. The emf of the galvanic cell is
(1) 0.36V (2) 1.16V (3) –0.40V (4) –0.76V

96. Hard water contains
(1) Small stones
(2) Oil
(3) Dissolved calcium & magnesium salts
(4) Bacteria

97. The unit used to express Hardness of water is
(1) Siemens (2) Volts (3) mg/L (4) Moles

98. Ion exchange process is done in water to remove
(1) Solid particles (2) Colour
(3) smell (4) Dissolved salts

99. Wet corrosion is best explained by
(1) Bohr's theory (2) Electrochemical theory
(3) Bronsted-Lowry theory (4) Arrhenius theory

100. By using Cathodic protection technique the corrosion of metal surface is avoided by making it work as
(1) Salt bridge of electrochemical cell
(2) Anode of electrochemical cell
(3) Cathode of electrochemical cell
(4) Insulator