

**TEST - 2015**

|           |                                     |                                       |
|-----------|-------------------------------------|---------------------------------------|
| <b>EE</b> | <b>COURSE</b>                       | <b>DAY : SUNDAY</b>                   |
|           | <b>ELECTRICAL &amp; ELECTRONICS</b> | <b>TIME : 10.00 A.M. TO 1.00 P.M.</b> |

|                      |                       |                                   |
|----------------------|-----------------------|-----------------------------------|
| <b>MAXIMUM MARKS</b> | <b>TOTAL DURATION</b> | <b>MAXIMUM TIME FOR ANSWERING</b> |
| <b>180</b>           | <b>200 MINUTES</b>    | <b>180 MINUTES</b>                |

| MENTION YOUR<br>DIPLOMA CET NUMBER |  |  |  |  | QUESTION BOOKLET DETAILS |               |
|------------------------------------|--|--|--|--|--------------------------|---------------|
|                                    |  |  |  |  | VERSION CODE             | SERIAL NUMBER |
|                                    |  |  |  |  | <b>A - 2</b>             | <b>142814</b> |

**DOs :**

1. Check whether the Diploma CET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. This Question Booklet is issued to you by the invigilator after the 2<sup>nd</sup> Bell i.e., after 09.50 a.m.
3. The Serial Number of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
4. The Version Code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
5. compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

**DON'Ts:**

1. **THE TIMING AND MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**
2. **The 3<sup>rd</sup> Bell rings at 10.00 a.m., till then;**
  - Do not remove the paper seal of this question booklet.
  - Do not look inside this question booklet.
  - Do not start answering on the OMR answer sheet.

**IMPORTANT INSTRUCTIONS TO CANDIDATES**

1. This question booklet contains 180 (items) questions and each question will have one statement and four answers. (Four different options / responses.)
2. After the 3<sup>rd</sup> Bell is rung at 10.00 a.m. remove the paper seal of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
3. During the subsequent 180 minutes:
  - Read each question (item) carefully
  - Choose one correct answer from out of the four available responses (options / choices) given under each question / item. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose only one response for each item.
  - **Completed darken / shade the relevant circle with a BLUE OR BLACK INK BALL POINT PEN against the question number on the OMR answer sheet.**

**Correct Method of shading the circle on the OMR answer sheet is as shown below:**

① ● ③ ④

4. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same
5. After the last Bells is rung at 1.00 p.m. stop marking on the OMR answer sheet and affix your left hand thumb impression on the OMR answer sheet as per the instructions.
6. Hand over the **OMR ANSWER SHEET** to the room invigilator as it is.
7. After separating the top sheet, the invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
8. Preserve the replica of the OMR answer sheet for a minimum period of **ONE year**.

**PART - A**  
**APPLIED SCIENCE**

1. One Pascal is equal to
  1. 10 dynes/cm<sup>2</sup>
  2. 1 dyne / cm<sup>2</sup>
  3. 100 dynes / cm<sup>2</sup>
  4. 0.1 dyne / cm<sup>2</sup>
2. To calm down turbulent sea, sailors use oil to
  1. Decrease surface tension
  2. Increase surface tension
  3. Decrease viscosity
  4. Increase cohesive force
3. The thrust on the bottom of the container having a base area of 20 m<sup>2</sup> filled with water to a height of 3 m is \_\_\_\_\_ (given g = 10m/s<sup>2</sup>)
  1. 6 x 10<sup>5</sup> N
  2. 6 x 10<sup>4</sup> N
  3. 6 x 10<sup>3</sup> N
  4. 6 x 10<sup>2</sup> N
4. Amount of heat required to raise the temperature of 1 kg of water through 1°C is
  1. One calorie
  2. One joule
  3. One kilo-calorie
  4. One kilojoule
5. Absolute scale of temperature has its zero at
  1. 0°C
  2. -100°C
  3. 273°C
  4. -273°C
6. In case of an ideal gas, the value of pressure or volume co-efficient is
  1.  $\frac{1}{273}$
  2.  $-\frac{1}{273}$
  3. 273
  4. -273
7. The distance travelled by the disturbance per unit time in a given direction is
  1. Wave amplitude
  2. Wave velocity
  3. Wave frequency
  4. Wavelength
8. The speed of the transverse wave along the stretched string is given by
  1.  $V = \sqrt{\frac{T}{m}}$
  2.  $V = \sqrt{\frac{m}{T}}$
  3.  $V = \sqrt{\frac{1}{T}}$
  4.  $V = \frac{\sqrt{m}}{T}$

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**Space For Rough Work**

9. Absorption co-efficient of sound wave is given by \_\_\_\_\_. Where  $E_m$  is energy absorbed by the given medium  $E_{ow}$  is the energy absorbed by open window.

1.  $a = \frac{E_m}{E_{ow}}$       2.  $a = \frac{E_{ow}}{E_m}$       3.  $a = E_m \times E_{ow}$       4.  $a = E_m + E_{ow}$

10. The rich quality of a musical note depends on

1. Fundamental frequency      2. Loudness  
3. Larger number of over tones      4. Pitch

11. Waxing and waning are the characteristics of

1. Periodic motion      2. Oscillations      3. Beats      4. Frequency

12. Velocity of sound in air varies

1. Inversely as the square root of the density of the medium  
2. Directly as the square root of the density of the medium  
3. Directly as the density of medium  
4. Inversely as the density of medium

13. The vibrations of a body of decreasing amplitude are called

1. Undamped free vibrations      2. Damped free vibrations  
3. Resonant vibrations      4. Forced vibrations

14. Another name for field emission is

1. Cold cathode emission      2. Thermionic emission  
3. Photoelectric emission      4. Secondary emission

15. In case of photoelectric emission, the rate of emission of electron is

1. Independent of frequency of radiation  
2. Dependent on frequency of radiation  
3. Dependent on wavelength of incident radiation  
4. Independent of intensity of radiation

16. Emission of radiation from radioactive element is

1. Slow      2. Fast      3. Spontaneous      4. Very slow

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**Space For Rough Work**

17. In the spectrum of scattered light the lines corresponding to wavelength greater than that of incident light are called
1. Stokes lines
  2. Antistokes lines
  3. Fluorescent lines
  4. Incident lines
18. Resolving power of telescope is given by
1.  $\frac{d}{1.22\lambda}$
  2.  $\frac{1.22\lambda}{d}$
  3.  $\frac{1.22d}{\lambda}$
  4.  $\frac{\lambda}{1.22d}$
19. To observe diffraction pattern the obstacle should be
1. Very big
  2. Dark
  3. Absent
  4. Comparable with the wavelength of light
20. When double refraction occurs, extraordinary ray and ordinary rays will have vibrations in the planes \_\_\_\_\_ to one another
1. Parallel
  2. Independent
  3. Perpendicular
  4. At  $45^\circ$
21. Maxwell's electromagnetic theory could explain
1. Photo electric effect
  2. Interference of light
  3. Compton effect
  4. Black body radiation
22. The contrast between bright and dark bands of an interference pattern is
1. Low
  2. High
  3. No change
  4. Gradually decreases
23. A non-electrolyte solution is
1. Sugar solution
  2. Salt solution
  3. Water
  4. Copper sulphate solution
24. In alkalies the concentration of  $OH^-$  ions is
1. More than  $10^{-7}$ g ions / litre
  2. Less than  $10^{-7}$ g ions / litre
  3. Equal to  $10^{-7}$ g ions / litre
  4. More than  $10^7$ g ions / litre

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**Space For Rough Work**

25. An example of derived unit is
1. Meter
  2. Second
  3. Netwon
  4. Candela
26. The prefix used for  $10^{-15}$  is
1. Femto
  2. Pico
  3. Peta
  4. Nano
27. An example of dimensionless constant is
1. Strain
  2. Efficiency
  3. Force
  4. Pi
28. A main scale is divided into half mm and having a Vernier containing 10 divisions has a least count of \_\_\_\_\_ cm.
1. 0.05
  2. 0.005
  3. 0.02
  4. 0.025
29. According to Newton's second law of motion  $F = Kma$ . The value of K is
1. 0.1
  2. 0
  3. 10
  4. 1
30. The velocity of a freely falling body is maximum
1. At the beginning
  2. Just before it touches ground
  3. Exactly half way
  4. After it touches ground
31. Wet clothes are dried in washing machine by the property of
1. Inertia of rest
  2. Inertia of direction
  3. Inertia of motion
  4. Inertia of time
32. A force of  $1.2 \times 10^{-2}$  N acts for 3 seconds on a body of mass 0.04kg at rest. The velocity gained by the body is
1. 0.9 m/s
  2. 9 m/s
  3. 0.09 m/s<sup>4</sup>
  4. 9.2 m/s
33. An example of vector quantity is
1. Volume
  2. Energy
  3. Density
  4. Force

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**Space For Rough Work**

34. Handle of the door is fixed away from the end where it is fixed with hinges to
1. Increase the moment of force
  2. Decrease the moment of force
  3. Keep the door firm
  4. Lock it easily
35. Resultant of two equal forces perpendicular to each other acts at an angle \_\_\_\_\_ to first force
1.  $90^\circ$
  2.  $180^\circ$
  3.  $30^\circ$
  4.  $45^\circ$
36. The resultant of two forces acting on a body cannot be
1. Greater than first force
  2. Zero
  3. Lesser than first force
  4. Lesser than the difference between two forces
37. Towing of a boat by two forces is an illustration of
1. Lami's theorem
  2. Law of triangle of forces
  3. Law of parallelogram of forces
  4. Law of polygon of forces
38. Shock absorber is an example for
1. Compressive stress
  2. Tensile stress
  3. Shear stress
  4. Shear strain
39. Factor of safety of a structure is
1. Within 2
  2. Equal to zero
  3. Vary between 5 and 10
  4. More than 10
40. In case of liquids as the temperature increases, the viscosity of liquid decreases due to
1. Increase in the rate of diffusion of gases
  2. Decrease in the rate of diffusion of gases
  3. Increase in the potential energy of molecules
  4. Increase in the kinetic energy of molecules

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**Space For Rough Work**

**PART - B**  
**APPLIED MATHEMATICS**

41. If  $x \sin 30^\circ - \sec 30^\circ \tan 30^\circ = \tan^2 60^\circ$ , then the value of  $x$  is

1.  $\frac{22}{3}$                       2.  $\frac{-22}{3}$                       3.  $\frac{11}{6}$                       4.  $\frac{3}{22}$

42. The value of  $\sin 225^\circ + \cos(-135^\circ)$  is

1.  $\sqrt{2}$                       2.  $-\sqrt{2}$                       3.  $\frac{1}{\sqrt{2}}$                       4.  $\frac{-1}{\sqrt{2}}$

43. The simplified value of  $\frac{\sin(180^\circ - A) \cot(90^\circ - A) \cos(360^\circ - A)}{\tan(180^\circ + A) \tan(90^\circ + A) \sin(-A)}$  is

1.  $\sin A$                       2.  $-\sin A$                       3. 1                      4.  $\operatorname{cosec} A$

44. The simplified value of  $\frac{\sin 2A}{1 + \cos 2A}$  is

1.  $2 \tan A$                       2.  $\sin A$                       3.  $\cot A$                       4.  $\tan A$

45. If  $\tan A = \frac{3}{4}$  and  $\tan B = \frac{1}{7}$ , then the value of  $(A+B)$  is

1.  $\frac{\pi}{6}$                       2.  $\frac{25}{23}$                       3.  $\frac{\pi}{4}$                       4.  $\frac{23}{25}$

46. The value of  $\cos 20^\circ + \cos 100^\circ + \cos 140^\circ$  is

1. 0                      2.  $\cos 50^\circ$                       3.  $\frac{1}{2}$                       4.  $\sin 50^\circ$

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**Space For Rough Work**

47. The value of  $\cos^{-1}[\tan 135^\circ]$  is

1.  $0^\circ$                       2.  $180^\circ$                       3.  $45^\circ$                       4.  $90^\circ$

48. The centroid of the triangle formed by the vertices  $(-10, 6)$ ,  $(2, -2)$  and  $(2, 5)$  is

1.  $(-2, 3)$                       2.  $(2, 3)$                       3.  $\left(-3, \frac{9}{2}\right)$                       4.  $(-6, 9)$

49. A point  $(-4, 3)$  divides the line AB externally in the ratio of 1 : 2. Given  $A(-1, -3)$  then the point B is

1.  $(6, -3)$                       2.  $(-10, 15)$                       3.  $(2, 9)$                       4.  $(2, -9)$

50. The area of triangle formed by the point,  $(3, -1)$ ,  $(2, 0)$  and  $(K, 4)$  is 10 Sq. Units, then the value of K is

1. 12                      2. 7                      3. -22                      4. 22

51. The slope of the line joining the points  $(-2, 3)$  and  $(4, -6)$  is

1.  $\frac{3}{2}$                       2.  $\frac{-3}{2}$                       3.  $\frac{2}{3}$                       4.  $\frac{-2}{3}$

52. The equation of straight line passing through  $(4, -1)$  and having equal intercepts is

1.  $x + y - 1 = 0$                       2.  $x + y - 5 = 0$                       3.  $x + y - 3 = 0$                       4.  $x + y + 3 = 0$

53. The equation of the line passing through  $(5, -2)$  and parallel to the line  $3x + 2y + 7 = 0$  is

1.  $3x + 2y - 11 = 0$                       2.  $3x - 2y + 11 = 0$   
3.  $3x - 2y - 19 = 0$                       4.  $2x - 3y - 16 = 0$

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**Space For Rough Work**



54. The value of  $\lim_{x \rightarrow -2} \frac{x+2}{x^5+32}$  is

1.  $\frac{1}{80}$

2. 80

3.  $-\frac{1}{80}$

4. -80

55. The value of  $\lim_{x \rightarrow 0} \frac{2x - \tan 3x}{\sin 2x + 3x^2}$  is

1.  $-\frac{1}{5}$

2. 0

3.  $\frac{1}{2}$

4.  $-\frac{1}{2}$

56. If  $y = e^x \log x$ , then  $\frac{dy}{dx}$  at  $x=1$  is

1.  $e^x$

2. e

3. 1

4. 0

57. If  $y = \tan^{-1} \sqrt{\frac{1+\cos x}{1-\cos x}}$ , then  $\frac{dy}{dx}$  is

1. 2

2. -2

3.  $-\frac{1}{2}$

4.  $\frac{1}{2}$

58. If  $\sqrt{x^3} + \sqrt{y^3} = \sqrt{a^3}$ , then  $\frac{dy}{dx}$  is

1.  $\sqrt{\frac{x}{y}}$

2.  $-\sqrt{\frac{x}{y}}$

3.  $\sqrt{\frac{y}{x}}$

4.  $-\sqrt{\frac{y}{x}}$

59. The second derivative of  $y = \log(\sec x - \tan x)$  is

1.  $-\sec x \tan x$

2.  $\sec x \tan x$

3.  $-\sec x$

4.  $\sec x$

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Space For Rough Work

60. Water flows into the cylindrical tank of radius 7mt at the rate of 294 cubic mt/sec, then the rate of height of water rising in the tank is

1.  $\frac{\pi}{6} \text{ mt/sec}$

2.  $\frac{6}{\pi} \text{ mt/sec}$

3.  $14406 \text{ mt/sec}$

4.  $\frac{21}{\pi} \text{ mt/sec}$

61. The maximum value of the function  $y = x + \frac{1}{x}$  is

1. 0

2. 2

3. 1

4. -2

62. The value of  $\int \tan^2 x \, dx$  is

1.  $\tan x - x + c$

2.  $x - \tan x + c$

3.  $(\sec^2 x)^2 + c$

4.  $-\cot x - x + c$

63. The value of  $\int \frac{\cos x}{1 + \sin x} \, dx$  is

1.  $\log(\sec^2 x + \sec x \tan x) + c$

2.  $\log(\sin x) + c$

3.  $\log(1 + \sin x) + c$

4.  $\frac{(1 + \sin x)^2}{2} + c$

64.  $\int \sin^2 x \sin 2x \, dx$  is

1.  $\frac{\sin^2 x}{2} + c$

2.  $\frac{\sin^4 x}{2} + c$

3.  $\sin^2 x + c$

4.  $\frac{-\sin^4 x}{2} + c$

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Space For Rough Work

65.  $\int_{-1}^1 (2x+1)(5-x) dx$  is

1. 10

2.  $\frac{26}{3}$

3.  $\frac{-26}{3}$

4.  $\frac{11}{3}$

66.  $\int_0^{\pi/4} \tan^2 x \sec^2 x dx$  is

1.  $\frac{1}{3}$

2.  $\frac{4}{3}$

3.  $\frac{1}{2}$

4.  $\frac{-1}{3}$

67. The RMS value of  $y^2 = x^2 - 2x$  over the interval  $[1, 3]$  is

1.  $\sqrt{\frac{5}{3}}$

2.  $\sqrt{\frac{2}{3}}$

3.  $\frac{1}{3}$

4.  $\frac{1}{\sqrt{3}}$

68. The differential equation of  $y^3 = 5ax$  by eliminating arbitrary constant  $a$  is

1.  $\frac{dy}{dx} - \frac{y}{3x} = 0$

2.  $\frac{dy}{dx} + \frac{y}{3x} = 0$

3.  $\frac{dy}{dx} - \frac{3y}{x} = 0$

4.  $\frac{dy}{dx} - \frac{5y}{3x} = 0$

69. The integrating factor of the differential equation  $x \frac{dy}{dx} - (1-x)y = x^3$  is

1.  $\frac{e^x}{x}$

2.  $xe^x$

3.  $e^{\frac{x^2-2x}{2}}$

4.  $e^{\frac{2x-x^2}{2}}$

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**Space For Rough Work**

70. If  $\begin{vmatrix} 2x+1 & -5x \\ 1 & 3 \end{vmatrix} = 0$ , then  $x$  is

1.  $\frac{3}{11}$

2.  $\frac{-3}{11}$

3.  $\frac{11}{3}$

4.  $-\frac{11}{3}$

71. For the simultaneous linear equations  $2x + y + z = 1$ ,  $x + y + 2z = 0$  and  $3x + 2y - z = 2$ , the value of  $\Delta x$  is

1. 3

2. -11

3. -7

4. -3

72. If  $A = \begin{bmatrix} 2 & 3 \\ 5 & 4 \end{bmatrix}$ ,  $B = \begin{bmatrix} -1 & 7 \\ -4 & 1 \end{bmatrix}$  then  $(A+B)^T$  is

1.  $\begin{bmatrix} 1 & 1 \\ 10 & 5 \end{bmatrix}$

2.  $\begin{bmatrix} 1 & 10 \\ 1 & 5 \end{bmatrix}$

3.  $\begin{bmatrix} -1 & 10 \\ -1 & 5 \end{bmatrix}$

4.  $\begin{bmatrix} -1 & -1 \\ 10 & 5 \end{bmatrix}$

73. If  $A = \begin{bmatrix} 1 & -3 \\ -5 & 7 \end{bmatrix}$ , then  $\text{adj } A$  is

1.  $\begin{bmatrix} 1 & -5 \\ -3 & 7 \end{bmatrix}$

2.  $\begin{bmatrix} 7 & -5 \\ -3 & 1 \end{bmatrix}$

3.  $\begin{bmatrix} -1 & -5 \\ -3 & -7 \end{bmatrix}$

4.  $\begin{bmatrix} 7 & 3 \\ 5 & 1 \end{bmatrix}$

74. The cofactor of O in  $A = \begin{bmatrix} 3 & -2 & 5 \\ 1 & 6 & 0 \\ 2 & 7 & -4 \end{bmatrix}$  is

1. -25

2. 25

3. -17

4. 0

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**Space For Rough Work**

75. If  $(\sqrt{3}+1)^3 = 10+6\sqrt{3}$ , then the value of  $(\sqrt{3}+1)^3 - (\sqrt{3}-1)^3$  is

1.  $12\sqrt{3}$                       2. 0                      3. 20                      4.  $20+\sqrt{3}$

76. The middle term in the expansion of  $\left(x^3 + \frac{1}{x^2}\right)^6$

1.  $10x^3$                       2.  $20x^3$                       3.  $\frac{20}{x^3}$                       4. 20

77. If  $\vec{a} = i + 3j - 2k$  and  $\vec{b} = 2i - j + 3k$ , then  $\vec{a} \cdot \vec{b}$  is

1. -5                      2. 11                      3. 7                      4. -7

78. The work done by the force  $2i - j + 6k$  when it displaces the particle from (5, 3, -2) to (7, -4, 8) is

1. 72                      2. 48                      3. -71                      4. 71

79. The sine of the angle between the vectors  $\vec{a} = i + j + k$  and  $\vec{b} = 2i - 3j - 4k$  is

1.  $\sqrt{\frac{62}{87}}$                       2.  $\sqrt{\frac{87}{62}}$                       3.  $\frac{-5}{\sqrt{87}}$                       4.  $\sqrt{\frac{10}{63}}$

80. If  $\cos \theta = \frac{5}{13}$  and  $\theta$  is acute angle, then the value of  $3 \cos \theta - 2 \sin \theta$  is

1.  $\frac{9}{13}$                       2. 3                      3.  $\frac{-9}{13}$                       4. -3

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**Space For Rough Work**

**PART - C**  
**ELECTRICAL AND ELECTRONICS ENGINEERING**

81. The instantaneous value of current  $i = 30 \sin 30 t$ . Then the r.m.s. value will be ..... amps  
1. 30                                      2. 21.21                                      3. 15                                      4. 12.21
82. Two vectors are represented by  $\bar{A} = 60 \angle 20^\circ$   $\bar{B} = 30 \angle 15^\circ$  then  $A \div B$  is \_\_\_\_\_  
1.  $2 \angle 5^\circ$                                       2.  $90 \angle 35^\circ$                                       3.  $2 \angle 35^\circ$                                       4.  $20 \angle 5^\circ$
83. The value of impedance of an AC circuit is  $(3 + j4)$  ohms. Then the magnitude of impedance will be ..... ohms  
1. 7                                      2. 25                                      3. 3                                      4. 5
84. Power factor of an RC circuit is .....  
1. Zero lagging                                      2. Between 0-1 leading  
3. Unity                                      4. Between 0-1 lagging
85. The power consumed by a 3-phase circuit is given by ..... watts  
1.  $\sqrt{3} V_L I_L$                                       2.  $3 V_{ph} I_{ph} \cos \theta$                                       3.  $3 V_L I_L$                                       4.  $3 V_{ph} I_{ph} \sin \theta$
86. The leakage current in a PN Junction is due to .....  
1. Minority Carriers                                      2. Majority Carriers  
3. Electrons only                                      4. Holes Only
87. The power gain of a transistor is expressed in .....  
1. Percentage                                      2. Decibels                                      3. Nibbles                                      4. Watts

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**Space For Rough Work**

88. In an opto coupler the I/P is given to .....

1. Transistor                      2. LDR                      3. LED                      4. LCD

89. For a Silicon diode, the value of forward bias voltage is typically ..... volts

1. Greater than 0.3                      2. Depends on width of depletion layer  
3. 0.7                      4. Less than 0.3

90. In medium scale Integration the number of components on a chip varies from

1. 10-100                      2. 100-10000  
3. 0-10                      4. Greater than 10000

91. The value of binary division  $11000_{(2)} \div 100_{(2)}$  is equal to .....

1. 111                      2. 101                      3. 1001                      4. 110

92. Two switches connected in series represents the equivalent logic for ..... gate

1. NOR                      2. AND                      3. OR                      4. XOR

93. The boolean expression  $(A + AB) (\overline{A \cdot B})$  can be simplified as .....

1.  $A\overline{B}$                       2. 0                      3. 1                      4.  $\overline{A}B$

94. The lowest power dissipation is observed in ..... logic family

1. TTL                      2. DTL                      3. CMOS                      4. ECL

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**Space For Rough Work**

95. The number  $100101_{(2)}$  is equivalent to octal number .....

1. 54                      2. 37                      3. 44                      4. 45

96. PIV of a diode in a centre tapped full wave rectifier is .....

1.  $V_m$                       2.  $2V_m$                       3.  $V_m/2$                       4.  $V_m/\sqrt{2}$

97. A push-pull Amplifier requires ..... amplifiers

1. 2 Class - B                      2. 2 Class - A                      3. 2 Class - C                      4. 2 Class - AB

98. The gain of a non-inverting op-Amp is equal to.....

1.  $R_f/R_i$                       2.  $1 - R_f/R_i$                       3.  $1 + \frac{R_f}{R_i}$                       4.  $1 + R_i/R_f$

99. Schmitt-trigger is also called ..... circuit

1. Circular                      2. Parabolic                      3. Elliptical                      4. Squaring circuit

100. The pulse width of a 555 timer connected in monostable mode is .....

1. RC                      2.  $1.1 RC$                       3.  $1.21 RC$                       4.  $0.69 RC$

101. The Boolean expression for sum output of a full adder is .....

1.  $A \oplus B \oplus C$                       2.  $A + B + C$                       3.  $AB + BC + CA$                       4.  $A(B+C)$

102. Toggling more than ones in a clock cycle is called .....

1. Face around condition                      2. Hold condition  
3. Race around condition                      4. Stable condition

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Space For Rough Work



103. Which of the following is not a shift register .....
1. SISO
  2. PISO
  3. SIPO
  4. PIPI
104. Total count given by a 3 bit asynchronous counter is .....
1. 16
  2. 8
  3.  $3^2$
  4. 10
105. IC 7442 is a .....
1. Decoder
  2. Encoder
  3. Flipflop
  4. Shift Register
106.  $2^N : 1$  multiplexer uses ..... select lines
1.  $N - 1$
  2.  $N + 1$
  3.  $N$
  4.  $N/2$
107. A 4 bit DAC ladder network comprises of following values of resistors.....
1.  $R$  and  $R$
  2.  $2R$  and  $3R$
  3.  $5R$  and  $4R$
  4.  $R$  and  $2R$
108. Which one of the following is a data distributor?
1. Multiplexer
  2. Demultiplexer
  3. Demodulator
  4. Power modulator
109. Lap winding is suitable for ..... current and ..... voltage in a DC generator.
1. High, low
  2. Low, high
  3. Low, low
  4. High, high
110. E.M.F. commutation is achieved by .....
1. Main poles
  2. Damper winding
  3. Interpoles
  4. Carbon brushes

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**Space For Rough Work**

111. In a shunt generator the terminal voltage is 200 V. Its shunt field resistance is  $50\Omega$  and it supplies 20A load current. Then the armature current is ..... amps
1. 28
  2. 42
  3. 60
  4. 24
112. The ratio  $E_b / V$  in a DC motor is the indication of its .....
1. Speed regulation
  2. Voltage regulation
  3. Efficiency
  4. Power output
113. As the load is increased, the speed of a DC shunt motor .....
1. Remains constant
  2. Decreases
  3. Increases
  4. Slightly reduces
114. By flux control method of speed control of a DC shunt motor we can obtain speed .....
1. Above the normal speed only
  2. Below the normal speed only
  3. Above and below normal speeds
  4. Not possible at all.
115. Stepper motor is a ..... device
1. Analog
  2. Incremental
  3. Mechanical
  4. Hydraulic
116. The armature reaction in an alternator primarily affects .....
1. Terminal voltage / phase
  2. Frequency
  3. Generated voltage / phase
  4. Rotor speed
117. At leading power factor, the armature flux in an alternator ..... the rotor flux
1. Opposes
  2. Aids
  3. Distorts
  4. Doesnot affect

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**Space For Rough Work**

118. Keeping excitation of alternator constant, if steam supply is increased then it will supply ..... of the load.

1. Same portion      2. Lesser portion      3. Half      4. Greater portion

119. In performing short circuit test of a transformer

1. HV side is usually short circuited      2. LV side is usually short circuited  
3. Short circuit cannot be done.      4. Both HV and LV are short circuited

120. The no-load primary current  $I_0$  is about ..... of full load primary current.

1. 3-5 %      2. 15-30 %      3. 30-40 %      4. 40-60 %

121. The most essential condition for parallel operation of two single-phase transformers is that, they should have the same .....

1. Polarity      2. kVA rating  
3. Voltage ratio      4. Percentage Impedance

122. In a  $3\phi$  Induction motor the relative speed of a stator flux with respect to rotor flux is .....

1. 25 %      2. 50 %      3. Zero      4. 75 %

123. A  $3\phi$  Induction motor with slip 'S' will have the rotor output equal to ..... times the rotor input

1. S      2.  $1 + S$       3.  $1/S$       4.  $(1-S)$

124. The ratio of  $N/N_s$  in an Induction motor is its .....

1. Rotor efficiency      2. Motor efficiency  
3. Stator efficiency      4. Over all efficiency

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**Space For Rough Work**

125. The speed of a squirrel cage induction motor can be varied by .....

- |                                 |                        |
|---------------------------------|------------------------|
| 1. Changing the number of poles | 2. Cascade connection  |
| 3. Rheostatic connection        | 4. Ward Leonard system |

126. Starting current of a star-delta starter is ..... times  $I_{sc}$

- |               |                         |      |               |
|---------------|-------------------------|------|---------------|
| 1. $\sqrt{2}$ | 2. $\frac{1}{\sqrt{3}}$ | 3. 3 | 4. $\sqrt{3}$ |
|---------------|-------------------------|------|---------------|

127. In a ..... motor, rotor field and stator field rotate at same speed.

- |                |                 |
|----------------|-----------------|
| 1. DC          | 2. Universal    |
| 3. Synchronous | 4. Asynchronous |

128. V - curves of a synchronous motor show the relation between .....

- |                |                |
|----------------|----------------|
| 1. $P_F / I_a$ | 2. $I_f / I_a$ |
| 3. $I_L / P_F$ | 4. $I_a / I_L$ |

129. A moving iron instrument has ..... scale

- |           |                |               |            |
|-----------|----------------|---------------|------------|
| 1. Linear | 2. Logarithmic | 3. Non-linear | 4. Squared |
|-----------|----------------|---------------|------------|

130. Torque to weight ratio of an instrument indicates .....

- |                |                |             |             |
|----------------|----------------|-------------|-------------|
| 1. Sensitivity | 2. Selectivity | 3. Accuracy | 4. Fidelity |
|----------------|----------------|-------------|-------------|

131. The primary current of a CT depends on .....

- |                    |          |                 |           |
|--------------------|----------|-----------------|-----------|
| 1. Applied voltage | 2. Power | 3. Load current | 4. Torque |
|--------------------|----------|-----------------|-----------|

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**Space For Rough Work**

132. In a two wattmeter method of measuring power, if one of the wattmeter reads zero, then the power factor of the circuit is .....

- |          |                |                 |                 |
|----------|----------------|-----------------|-----------------|
| 1. Unity | 2. 0.5 lagging | 3. Zero lagging | 4. Zero leading |
|----------|----------------|-----------------|-----------------|

133. LVDT can be used to measure .....

- |                 |           |          |                 |
|-----------------|-----------|----------|-----------------|
| 1. Acceleration | 2. Torque | 3. Speed | 4. Displacement |
|-----------------|-----------|----------|-----------------|

134. Anderson bridge is used for the measurement of .....

- |               |               |                |                |
|---------------|---------------|----------------|----------------|
| 1. Inductance | 2. Resistance | 3. Capacitance | 4. Conductance |
|---------------|---------------|----------------|----------------|

135. If modulation index  $m > 1$  then it causes .....

- |                       |                         |
|-----------------------|-------------------------|
| 1. Good amplification | 2. Severe distortion    |
| 3. No amplification   | 4. It cannot be defined |

136. Fibre optic cable uses ..... for transmission

- |                |                |
|----------------|----------------|
| 1. Sound waves | 2. Heat waves  |
| 3. UV rays     | 4. Light waves |

137. Hollow metal pipe which carry microwave is .....

- |               |                      |
|---------------|----------------------|
| 1. Waveguide  | 2. Can't carry waves |
| 3. Rail waves | 4. Current guide     |

138. Klystron microwave tube is having ..... and ..... cavity

- |                      |                         |
|----------------------|-------------------------|
| 1. Buncher, clutcher | 2. Buncher and catcher  |
| 3. Catcher, blaster  | 4. Amplifier oscillator |

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**Space For Rough Work**

139. The data rate of fast internet is .....

1. 10 mbps                      2. 50 mbps                      3. 100 mbps                      4. 200 mbps

140. Repeater operates at ..... layer of OSI model

1. Presentation                      2. Datalink                      3. Transport                      4. Physical

141. When the water is below the sea level then it is called ..... tide

1. WEB                      2. HUB                      3. SUBB                      4. EBB

142. Basic fuel for a fuel cell is .....

1. Hydrogen                      2. Nitrogen                      3. Oxygen                      4. Carbon dioxide

143. Load factor is the ratio of .....

- |  |  |
|--|--|
| 1. $\frac{\text{Maximum demand}}{\text{Average demand}}$ | 2. $\frac{\text{Average demand}}{\text{Maximum demand}}$ |
| 3. $\frac{\text{RMS demand}}{\text{Average demand}}$     | 4. $\frac{\text{Annual demand}}{\text{Monthly demand}}$  |

144. .... Serves as a regulating reservoir storing water temporarily

- |               |               |
|---------------|---------------|
| 1. Surge tank | 2. Spill ways |
| 3. Fore bay   | 4. Sea bay    |

145. Diversity factor is always .....

- |                   |                |
|-------------------|----------------|
| 1. Greater than 1 | 2. Less than 1 |
| 3. Equal to 1     | 4. Zero        |

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**Space For Rough Work**

146. In an R-firing circuit the firing angle can be controlled from .....

1. 0 - 180°                      2. 0 - 90°                      3. 90 - 180°                      4. 0 - 360°

147. The power line disturbance undervoltage is also called .....

1. Black out                      2. Fuse out                      3. Kick out                      4. Brown out

148. DC to DC converters are also called .....

1. Choppers                      2. Inverters                      3. Chippers                      4. Cyclo converters

149.  $\frac{DI}{dt}$  protection for a thyristor is provided by .....

1. Resistance                      2. Conductance                      3. Inductance                      4. Capacitance

150. Single-phase half wave controlled rectifier uses ..... SCRS

1. 2                      2. 4                      3. 6                      4. 8

151. Flyback converter is an isolated converter which is based on ..... converter to follow

1. Buck                      2. Boost                      3. Buck - boost                      4. Cyclo

152. A linear regulated power supply has ..... efficiency compared to SMPS

1. Less                      2. More                      3. Equal                      4. Zero

153. A cyclo converter is .....

1. AC to DC converter                      2. AC to AC converter without a DC link  
3. AC to AC converter with DC link                      4. DC TO DC converter with AC link

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**Space For Rough Work**

154. A fully controlled Converter is used for .....
1. SMPS
  2. AC motor drives
  3. DC motor drives
  4. Voltage regulators
155. A ..... circulates energy stored in the load inductance into the load itself
1. Free wheeling diode
  2. SCR
  3. Triac
  4. Diac
156. The phenomena of current interruption before natural current zero is .....
1. Voltage chopping
  2. Current chopping
  3. Power splitting
  4. Current splitting
157. If the length of the arc increases, its resistance .....
1. Remains same
  2. Decreases
  3. Increases
  4. Becomes zero
158. A relay performs the function of .....
1. Fault detection
  2. Fault correction
  3. Fault clearance
  4. Short circuiting
159. Buchholz's relay is a ..... relay
1. Bulb relay
  2. Gas actuated relay
  3. It is not a relay
  4. Power relay
160. Speed-time curve of a mainline service can be approximated as ..... curve
1. Rectangular
  2. Square
  3. Trapezoidal
  4. Circular

---

**Space For Rough Work**



161. Pantograph collector is used when the vehicle runs at ..... speed

- |           |        |             |         |
|-----------|--------|-------------|---------|
| 1. Medium | 2. Low | 3. Constant | 4. High |
|-----------|--------|-------------|---------|

162. Plugging can be achieved in Induction motors by .....

- |                           |                             |
|---------------------------|-----------------------------|
| 1. Reversing static field | 2. Reversing rotatory field |
| 3. Primary controlling    | 4. Auto transformer control |

163. .... need frequent starting and stopping of electric motors

- |                     |              |                  |             |
|---------------------|--------------|------------------|-------------|
| 1. Lifts and Hoists | 2. Conveyors | 3. Rolling mills | 4. Crushers |
|---------------------|--------------|------------------|-------------|

164. The electrode of a direct arc furnace is made of .....

- |             |           |             |              |
|-------------|-----------|-------------|--------------|
| 1. Tungsten | 2. Copper | 3. Graphite | 4. Aluminium |
|-------------|-----------|-------------|--------------|

165. The spot welding makes use of ..... electrode

- |           |             |              |               |
|-----------|-------------|--------------|---------------|
| 1. Tipped | 2. Circular | 3. Projected | 4. Elliptical |
|-----------|-------------|--------------|---------------|

166. Which of the following lamps should always be mounted vertically

- |                         |                       |
|-------------------------|-----------------------|
| 1. Nitrogen vapour lamp | 2. Sodium vapour lamp |
| 3. Mercury vapour lamp  | 4. CFL                |

167. A refrigerator works on the principle of .....

- |                 |                         |
|-----------------|-------------------------|
| 1. Increasing   | 2. Maintaining constant |
| 3. Keeping zero | 4. Reducing             |

---

**Space For Rough Work**

168. Reciprocal of Resistance is called.....

1. Inductance                      2. Conductance                      3. Capacitance                      4. Admittance

169. Slope of the line drawn for Ohm's law represents.....

1. Voltage                      2. Current                      3. Resistance                      4. Power

170. 1 kWh of Electrical energy is equal to ..... Joules

1.  $36 \times 10^5$                       2.  $3600 \times 10^5$                       3.  $36 \times 10^{-5}$                       4.  $3.6 \times 10^5$

171. Two similar charges of 1 coulomb are placed in air 1 mt apart, the force experienced is .....N

1.  $90 \times 10^9$                       2.  $8.85 \times 10^{12}$                       3.  $1 \times 10^9$                       4.  $9 \times 10^9$

172. Electric intensity 'E' is given by ..... N/C

1.  $F/Q$                       2.  $Q/F$                       3.  $Q^2/E$                       4.  $E/Q^2$

173. The time constant of a capacitor voltage actually rises to ..... of its final steady state value

1. Maximum value                      2. 0.5                      3. 0.632                      4. 0.75

174. The capacity of a cell is measured in .....

1. Watt hour                      2. Watts                      3. Amperes                      4. Amp-hour

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**Space For Rough Work**

175. Trickle charging of a storage battery helps to.....

- |                                      |                                    |
|--------------------------------------|------------------------------------|
| 1. Prevent sulphation                | 2. Keep it fresh and fully charged |
| 3. Maintain proper electrolyte level | 4. Increase capacity               |

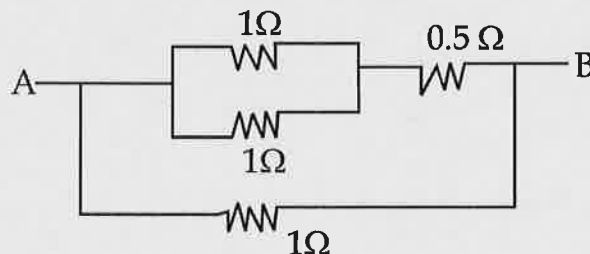
176. Which of the following material is having zero temperature coefficient of resistance

- |           |            |           |           |
|-----------|------------|-----------|-----------|
| 1. Copper | 2. Silicon | 3. Rubber | 4. Eureka |
|-----------|------------|-----------|-----------|

177. Diode Rectifier is a ..... circuit

- |               |              |           |                  |
|---------------|--------------|-----------|------------------|
| 1. Unilateral | 2. Bilateral | 3. Linear | 4. Bidirectional |
|---------------|--------------|-----------|------------------|

178. The equivalent resistance between points A and B is



- |              |                |                |                |
|--------------|----------------|----------------|----------------|
| 1. $1\Omega$ | 2. $2.5\Omega$ | 3. $0.5\Omega$ | 4. $1.5\Omega$ |
|--------------|----------------|----------------|----------------|

179. Relative permeability of air is .....

- |                          |                           |      |      |
|--------------------------|---------------------------|------|------|
| 1. $4\pi \times 10^{-7}$ | 2. $8.854 \times 10^{12}$ | 3. 1 | 4. 0 |
|--------------------------|---------------------------|------|------|

180. The formula for dynamically induced e.m.f. is given by .....

- |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|
| 1. $Blv \cos \theta$ | 2. $BIL \sin \theta$ | 3. $Blv \sin \theta$ | 4. $BIL \cos \theta$ |
|----------------------|----------------------|----------------------|----------------------|

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SEAL