D-C E T – 2018

	COURSE	VERSION CODE	QUESTION BOOKLET SERIAL NUMBER
EE	**ELECTRICAL AND ELECTRONICS**	**A**	122275

MAXIMUM MARKS	TOTAL DURATION	TIME
180	200 Minutes	10.00 a.m. to 1.00 p.m.

MAXIMUM TIME FOR ANSWERING	MENTION YOUR DIPLOMA CET NUMBER				
180 Minutes					

DOs :

1. Candidate must verify that the DCET number and Name printed on the OMR Answer Sheet is tallying with the DCET number and Name printed on the Admission Ticket. Discrepancy if any, report to invigilator.
2. This question booklet is issued to you by the invigilator after the **2nd bell i.e., after 9.50 a.m.**
3. The Version Code of this Question Booklet should be entered on the OMR Answer Sheet and the respective circle should also be shaded completely.
4. The Version Code and Serial Number of this question booklet should be entered on the Nominal Roll without any mistakes.
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 **3rd Bell rings at 10.00 a.m., till then;**
   - Do not remove the seal present on the right hand side 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 **3rd 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.
   - Completely **darken / shade** the relevant circle with a **blue or black ink ballpoint pen against the question number on the OMR answer sheet.**

ಸರಿಯಾದ ಕ್ರಮ CORRECT METHOD	ತಪ್ಪು ಕ್ರಮಗಳು WRONG METHODS
① ● ③ ④	✗ ② ③ ④ ① ② ③ ✓ ① ● ● ④
	● ② ③ ④ 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 bell 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 (Dept. Copy), 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.**

[P.T.O.

DO NOT WRITE HERE

PART – A

It consists of **1 – 40** questions.

1. If $A = \begin{bmatrix} 3 & 0 \\ -2 & 1 \end{bmatrix}$, then $2A - 3A^T =$

(1) $\begin{bmatrix} -3 & -6 \\ -4 & 1 \end{bmatrix}$ (2) $\begin{bmatrix} -3 & 6 \\ -2 & 1 \end{bmatrix}$

(3) $\begin{bmatrix} -3 & 6 \\ -4 & -1 \end{bmatrix}$ (4) $\begin{bmatrix} -3 & 6 \\ 4 & -1 \end{bmatrix}$

2. If $\begin{bmatrix} 3 & 4 & x \end{bmatrix} \begin{bmatrix} -1 \\ 2 \\ 5 \end{bmatrix} = [2x + 8]$ then the value of x =

(1) 1 (2) –1

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

3. If $\begin{vmatrix} 3 & m-1 \\ m+1 & 2 \end{vmatrix} = 3$, then the value of m =

(1) ±1 (2) $\pm\sqrt{2}$

(3) ±3 (4) ±2

4. In solving simultaneous linear equations $x - y = 4$, $2y + 3z = -2$ and $3x + y + 2z = 1$ using Cramer's rule, the value of determinant of co-efficients of x, y and z is

(1) 6 (2) 12

(3) –8 (4) –16

SPACE FOR ROUGH WORK

5. If $A = \begin{bmatrix} -2 & 5 \\ 2 & -3 \end{bmatrix}$, then inverse of A =

(1) $\frac{1}{4}\begin{bmatrix} 2 & -5 \\ -2 & 3 \end{bmatrix}$ (2) $\frac{1}{4}\begin{bmatrix} -3 & -5 \\ -2 & -2 \end{bmatrix}$

(3) $\frac{1}{4}\begin{bmatrix} -2 & 2 \\ 5 & -3 \end{bmatrix}$ (4) $\frac{1}{4}\begin{bmatrix} 3 & 5 \\ 2 & 2 \end{bmatrix}$

6. The characteristic roots of the matrix $\begin{bmatrix} 4 & -2 \\ -3 & -1 \end{bmatrix}$ are

(1) 2 and –5 (2) –2 and 5

(3) –2 and –5 (4) 2 and 5

7. If $\vec{a} = 2\hat{i} - 3\hat{j} + 5\hat{k}$
$\vec{b} = 3\hat{i} - 2\hat{j} - 5\hat{k}$ and
$\vec{c} = \hat{i} + 4\hat{k}$

then the scalar product of $\vec{a} + \vec{b}$ and $\vec{b} - \vec{c}$ is

(1) –9 (2) 9

(3) 20 (4) –20

8. If A, B and C are three consecutive vertices of a parallelogram with position vectors $3\hat{i} - 2\hat{j} + \hat{k}$, $2\hat{i} + \hat{j} - \hat{k}$ and $\hat{i} - \hat{j} + \hat{k}$, then area of the parallelogram is

(1) $3\sqrt{5}$ sq. units (2) $5\sqrt{3}$ sq. units

(3) $2\sqrt{5}$ sq. units (4) $5\sqrt{2}$ sq. units

9. Work done by the force 2i – 3j + 5k in moving a particle from (–3, 1, 2) to (1, –1, 1) is

(1) 3 (2) 9

(3) 6 (4) 15

SPACE FOR ROUGH WORK

10. The probability of drawing a non-diamond card from a well shuffled deck of 52 cards is

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

(3) $\frac{1}{4}$ (4) $\frac{12}{13}$

11. If $\tan\theta = \frac{2}{3}$ and $\pi < \theta < \frac{3\pi}{2}$, then $\sin\theta + \cos\theta =$

(1) $\frac{5}{\sqrt{13}}$

(2) $\frac{-1}{\sqrt{13}}$

(3) $\frac{1}{\sqrt{13}}$

(4) $\frac{-5}{\sqrt{13}}$

12. If $\tan A + \tan B + \tan A \tan B = 1$, then $A + B =$

(1) 180° (2) 90°

(3) 45° (4) 360°

13. $\sqrt{\frac{1-\cos 40°}{1+\cos 40°}} =$

(1) tan 20° (2) cot 40°

(3) tan 10° (4) tan 40°

14. If $\tan A = \frac{1}{2}$ and $\tan B = \frac{2}{3}$ then $\tan(A - B)$ is

(1) –1 (2) 1

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

SPACE FOR ROUGH WORK

15. The numerical value of $\sin 10° \sin 50° \sin 70°$ =

(1) $\frac{\sqrt{3}}{8}$ (2) $\frac{1}{8}$

(3) $\frac{3}{16}$ (4) $\frac{1}{16}$

16. $\frac{\sin 12° + \cos 12°}{\sin 12° - \cos 12°} =$

(1) cot 33° (2) –tan 33°

(3) –tan 57° (4) tan 57°

17. The polar form of the complex number $\sqrt{3} - i$ is

(1) $2\left[\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right]$ (2) $2\left[\cos\frac{\pi}{6} - i\sin\frac{\pi}{6}\right]$

(3) $2\left[\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}\right]$ (4) $2\left[\cos\frac{\pi}{3} - i\sin\frac{\pi}{3}\right]$

18. The value of $\lim_{x\to\infty} x\left[\sqrt{x^2+1} - x\right]$ is

(1) 1 (2) 2

(3) $\frac{1}{2}$ (4) 0

19. The value of $\underset{x\to 3}{Lt} \frac{x\sqrt{x} - 3\sqrt{3}}{\sin(x-3)}$ is

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

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

SPACE FOR ROUGH WORK

20. The value of $\lim_{x \to 0} \frac{1-\sqrt{\cos x}}{x^2}$ is

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

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

21. The equation of line passing through the point (1, –3) and having slope $\frac{1}{2}$ is

(1) $x - 2y - 7 = 0$ (2) $2x - y + 7 = 0$

(3) $x - 2y - 4 = 0$ (4) $x - y + 4 = 0$

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

(1) $5x + 3y - 19 = 0$ (2) $5x + 3y + 1 = 0$

(3) $5x + 3y + 19 = 0$ (4) $3x - 5y + 1 = 0$

23. If $y = e^x \log x$ then $\frac{dy}{dx}$ is

(1) $e^x\left[\frac{1}{x} + \log x\right]$ (2) $e^x\left[\frac{1}{x} - \log x\right]$

(3) $e^x \cdot \frac{1}{x}$ (4) $e^x + \frac{1}{x}$

24. If $y = \log(\tan x + \sec x)$, then $\frac{dy}{dx}$ is,

(1) $-\sec x$

(2) $\sec x$

(3) $\frac{\sec x}{\tan x + \sec x}$

(4) $\log(\sec^2 x + \tan x \sec x)$

SPACE FOR ROUGH WORK

25. If $\frac{x^2}{2}+\frac{y^2}{2}=1$ then $\frac{dy}{dx}$ is

(1) $\frac{1+x}{y}$ (2) $\frac{x}{y}$

(3) $\frac{-x}{y}$ (4) $\frac{1-x}{y}$

26. If $x=\frac{1}{t}$; $y=3t^3$ then $\frac{dy}{dx}$ is,

(1) $-6t^4$ (2) $-9t^4$

(3) -6 (4) -9

27. If $y=(\sin x)^{\log x}$ then $\frac{dy}{dx}$ is

(1) $(\sin x)^{\log x}\left[\log x\cos x+\frac{\log \sin x}{x}\right]$ (2) $(\sin x)^{\log x}\left[\frac{\log x}{\sin x}+\frac{\log \sin x}{x}\right]$

(3) $(\sin x)^{\log x}$ [$-\log x \cot x + \log \sin x$] (4) $(\sin x)^{\log x}\left[\log x \cot x+\frac{\log \sin x}{x}\right]$

28. If $y=e^{5x}+e^{-5x}$ then $\frac{d^2y}{dx^2}$ at $x=0$ is,

(1) 25 (2) -25

(3) 50 (4) -50

29. The rate of change of volume of a sphere with respect to radius, when its radius 3 cm is

(1) 3π (2) 6π

(3) 18π (4) 36π

30. The equation of normal to the curve $y=x^2$ at (2, 2) is

(1) $x-4y-10=0$ (2) $x-4y+10=0$

(3) $x+4y-10=0$ (4) $x+4y+10=0$

SPACE FOR ROUGH WORK

31. The value of $\int e^{5\log x}\,dx$ is

(1) $5x^4 + C$ (2) $\frac{x^6}{6} + C$

(3) $6x^6 + C$ (4) $\frac{x^5}{5} + C$

32. The value of $\int \frac{\cos x - \sin x}{\cos x} dx$ is

(1) $x - \cos x + C$ (2) $x + \cos x + C$

(3) $x + \log \sec x + C$ (4) $x - \log \sec x + C$

33. The value of $\int (2 + \sin^3 x)\cos x\,dx$ is,

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

(3) $2\cos x + \frac{(\cos x)^4}{4} + C$ (4) $\frac{\cos^4 x}{4} + C$

34. The value of $\int \frac{x+5}{x^2+10x-5} dx$ is,

(1) $\log (x^2 + 10x - 5)^2 + C$ (2) $\frac{1}{2}\log (x^2 + 10x - 5) + C$

(3) $\frac{1}{2}\log (x + 5) + C$ (4) $\log (x + 5)^2 + C$

35. The value of $\int 4x \log 5x\,dx$ is,

(1) $\frac{x^2 \log 5x}{2} - \frac{x^2}{4} + C$ (2) $\frac{x \log 5x}{5} + \frac{x^2}{2} + C$

(3) $5x \log 5x + 1 + C$ (4) $2x^2 \log 5x - x^2 + C$

SPACE FOR ROUGH WORK

36. $\int_0^{\pi/4} \frac{\sec^2 x}{1+\tan x}\,dx =$

(1) $-\log 2$ (2) $\log 2$

(3) $\log 3$ (4) $\log 4$

37. The volume of a solid generated by revolving the curve $y = \tan x$ about x-axis between the lines $x = 0$ and $x = \frac{\pi}{4}$ is,

(1) $\pi + \frac{\pi^2}{4}$ cu. units (2) $1 + \frac{\pi}{4}$ cu. units

(3) $1 - \frac{\pi}{4}$ cu. units (4) $\pi - \frac{\pi^2}{4}$ cu. units

38. Order and degree of differential equation $\frac{d^2y}{dx^2} = \sqrt{1 - \frac{dy}{dx}}$ are

(1) 2 and 2 respectively (2) 2 and 1 respectively

(3) 1 and 2 respectively (4) 1 and 1 respectively

39. The differential equation obtained by eliminating the arbitrary constants from the equation $y^2 = a \sin x + b \cos x$ is

(1) $2y\frac{d^2y}{dx^2} + 2\left(\frac{dy}{dx}\right)^2 - y^2 = 0$ (2) $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 + y^2 = 0$

(3) $2y\frac{d^2y}{dx^2} - 2\left(\frac{dy}{dx}\right)^2 + y^2 = 0$ (4) $2y\frac{d^2y}{dx^2} + 2\left(\frac{dy}{dx}\right)^2 + y^2 = 0$

40. The solution of differential equation $x\frac{dy}{dx} + y = x - 1$ is

(1) $xy = x - \frac{x^2}{2} + C$ (2) $xy = \frac{x^2}{2} - x + C$

(3) $xy + \frac{x^2}{2} + x = C$ (4) $xy - \frac{x^2}{2} - x = C$

SPACE FOR ROUGH WORK

PART – B

It consists of **41 – 80** questions.

41. The value of 20 peta Hertz is

(1) 20×10^9 Hz (2) 20×10^{12} Hz

(3) 20×10^{15} Hz (4) 20×10^{18} Hz

42. The total reading for Screw Gauge is found by

(1) TR = PSR + (HSR × LC) ± ZE

(2) TR = PSR + (HSR × LC) ± ZC

(3) TR = (PSR + HSR) × LC ± ZE

(4) TR = (PSR + HSR) × LC ± ZC

43. The least count of a slide calipers is 0.01 cm. In a setting the zero of the Vernier Scale lies between 3.2 cm and 3.3 cm and 5^{th} division of the Vernier co-incides with the main scale division. The total reading is

(1) 3.35 cm (2) 3.35 mm

(3) 3.25 cm (4) 3.25 mm

44. The rectangular component of a vector R are

(1) $R_X = R\cos\theta$, $R_Y = R\sin\theta$

(2) $R_X = R\sin\theta$, $R_Y = R\cos\theta$

(3) $R_X = \cos\theta$; $R_Y = \sin\theta$

(4) $R_X = -\cos\theta$; $R_Y = -\sin\theta$

45. A body of weight 5 kg is suspended by means of a light string. It is pulled horizontally until the string makes an angle of 30° with the vertical. Then the horizontal force applied is

(1) $\frac{1}{\sqrt{3}}$ kg wt (2) 5 kg wt

(3) $5\sqrt{3}$ kg wt (4) $\frac{5}{\sqrt{3}}$ kg wt

SPACE FOR ROUGH WORK

46. Among these which is the vector quantity ?
    (1) Work (2) Energy
    (3) Surface tension (4) Power

47. The resultant of two like parallel forces P and Q acting at a point is
    (1) P + Q away from P
    (2) P + Q away from Q
    (3) P ~ Q in between P and Q
    (4) P + Q in between P and Q

48. Shock absorbers in automobiles is an example for
    (1) Tensile stress (2) Compressive stress
    (3) Shear stress (4) Breaking stress

49. The elasticity of steel compared to rubber is
    (1) More (2) Less
    (3) Equal (4) Less than or equal

50. The stress-strain graph for an elastic body within elastic limit is
    (1) Linear (2) Curved
    (3) Parabola (4) Hyperbola

51. The maximum stress of steel wire is 500 N/mm^2, if the area of cross section of wire is 0.05 m^2 then the force is
    (1) 25 N (2) 25 KN
    (3) 25 MN (4) 250 N

52. In case of concave meniscus, the angle of contact is
    (1) Acute (2) Right angle
    (3) Linear (4) Obtuse

SPACE FOR ROUGH WORK

53. The surface tension of a liquid varies as
    (1) Directly with temperature, inversely with density
    (2) Directly with both temperature and density
    (3) Inversely with both temperature and density
    (4) Inversely with temperature and directly with density

54. The thrust on the bottom of a container having base area 0.5 m^2 filled with water to a height of 6 cm is
    (1) 147 N (2) 294 N
    (3) 147 dynes (4) 294 dynes

55. The fastest mode of transfer of heat is
    (1) Conduction (2) Convection
    (3) Radiation (4) Transmission

56. Pressure is directly proportional to absolute temperature at constant volume is a statement of
    (1) Charle's law (2) Boyle's law
    (3) Gay-Lussac's law (4) Boltzmann's law

57. Boyle's law is applicable for
    (1) Isothermal process (2) Isobaric process
    (3) Isochoric process (4) Isotonic process

58. At absolute zero temperature, the pressure and volume of a given mass of gas is
    (1) 1 (2) 273
    (3) −273 (4) 0

59. In cold countries, the windows are provided with double doors because
    (1) Air between two windows behaves as a perfect insulator
    (2) Air between two windows behaves as a perfect conductor
    (3) To strengthen the windows
    (4) Security purpose

SPACE FOR ROUGH WORK

60. The sound waves and light waves can be differentiated by

(1) Interference (2) Diffraction

(3) Reflection (4) Polarization

61. The velocity of sound in gas is independent of

(1) Temperature (2) Pressure

(3) Humidity (4) Density

62. The superposition of two waves of same frequency moving in opposite direction is

(1) Progressive wave (2) Transverse waves

(3) Sound wave (4) Stationary wave

63. For every degree raise of temperature, the velocity of sound waves in gas is increased by

(1) 6 m/s (2) 60 m/s

(3) 0.6 s/m (4) 0.6 m/s

64. The angle between the particle vibration and wave propagation in a transverse wave is

(1) 0° (2) 45°

(3) 90° (4) 180°

65. The original tension in the string if the frequency of a sonometer wire is doubled, when the tension is increased by 12 kg wt is

(1) 2 kg wt (2) 4 kg wt

(3) 8 kg wt (4) 12 kg wt

66. At resonance, the body vibrates with

(1) Small amplitude (2) Large amplitude

(3) Zero amplitude (4) Same amplitude

SPACE FOR ROUGH WORK

67. Beats occurs in mining due to the presence of
    (1) Ore (2) Water
    (3) Contaminated air (4) Fossils

68. The statement which is correct in these is
    (1) X-rays have longer wavelength than microwaves
    (2) Gamma rays have shorter wavelength than microwaves
    (3) UV-rays have shorter wavelength than violet rays
    (4) Red rays have longer wavelength than infrared rays

69. LASER is used in
    (1) LIDAR (2) RADAR
    (3) SONAR (4) GPS

70. Nano means
    (1) One hundredth of meter
    (2) One thousandth of meter
    (3) One millionth of meter
    (4) One billionth of meter

71. Microphone is a
    (1) Transducer (2) Receiver
    (3) Channel (4) Transmitter

72. The principle behind optical fibre is
    (1) Total internal refraction (2) Total internal reflection
    (3) Reflection (4) Refraction

73. Faraday's I law of electrolysis is represented mathematically as
    (1) $M = ZQ$ (2) $Z = MQ$
    (3) $Q = MZ$ (4) $M = \frac{Z}{Q}$

SPACE FOR ROUGH WORK

74. A galvanic cell setup between two dissimilar metals in contact is called
(1) Concentration cell (2) Composition cell
(3) Stress cell (4) Secondary cell

75. In which of these cells the reaction can be reversed ?
(1) Primary cell (2) Secondary cell
(3) Solar cell (4) Photo cell

76. The statement which is true for fuel cell is
(1) They make more pollution
(2) They produce noise
(3) They liberate more heat
(4) They are heavy in weight

77. Alloy of steel is a mixture of
(1) Chromium, iron and nickel
(2) Chromium, iron and zinc
(3) Chromium, iron and aluminium
(4) Chromium, iron and tin

78. The materials with weak intermolecular forces of attraction between polymer chains are
(1) Elastomers (2) Fibres
(3) Thermoplastic (4) Thermosetting polymers

79. The type of composite material to which reinforced concrete belongs is
(1) Laminate (2) Particulate
(3) Short fibre (4) Long fibre

80. pH value of a solution is given by
(1) $-\log_{10}[H^+]$ (2) $-\log_e[OH^-]$
(3) $-\log_e[H^+]$ (4) $\log_{10}[H^+]$

SPACE FOR ROUGH WORK

PART – C

It consists of **81 – 180** questions.

81. Electricity at rest is called

(1) Dynamic Charge (2) Positive Charge

(3) Static Charge (4) Negative Charge

82. The two resistances R_1 and R_2 are connected in parallel this parallel combination is connected in series with R_3 the equivalent resistance is

(1) $\frac{R_1+R_2}{R_1R_2}+R_3$ (2) $\frac{R_1R_2}{R_1+R_2}+R_3$

(3) $\frac{R_1R_3}{R_1+R_3}+R_2$ (4) $\frac{R_1+R_3}{R_1R_3}+R_2$

83. When 1Ω, 3Ω, 6Ω and 9Ω resistors are connected in series across 100 V DC supply. The resistor which has less voltage drop is

(1) 6Ω (2) 9Ω (3) 3Ω (4) 1Ω

84. Resistance of mercury is

(1) Increases with temperature (2) Decreases with temperature

(3) Remains constant (4) Is zero at all temperature

85. A house consists of 100 W bulbs of three no. and 70 W fan of 3 no. If they are used 5 hrs a day. The units consumed per week

(1) 15.05 kWh (2) 17.85 kWh

(3) 16.75 kWh (4) 18.25 kWh

86. Heat utilized by a substance is given by

(1) E^2Rt Joules (2) IRt^2 Joules

(3) $MS(t_2 - t_1)$ Joules (4) M^2S Joules

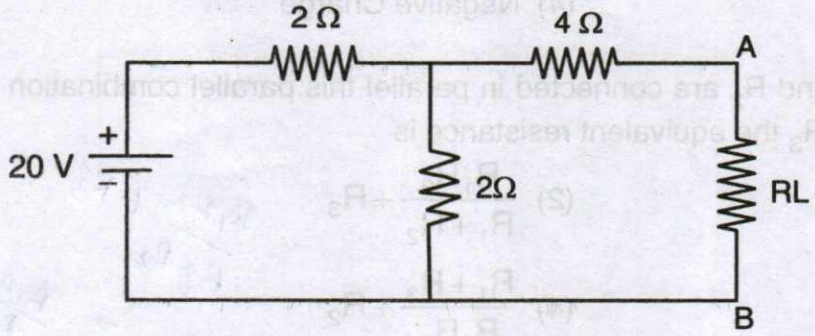
SPACE FOR ROUGH WORK

87. If the capacitance is 4 μF for a potential difference of 2000 V the charge deposited is

(1) 8×10^{-3} C (2) 6×10^{-3} C

(3) 5×10^{-6} C (4) 4×10^{-6} C

88. The Thevenin voltage V_{th} and Thevenin resistance R_{th} between the terminals A and B of the circuit is



(1) 20 V, 5 Ω (2) 10 V, 5 Ω

(3) 10 V, 3.33 Ω (4) 20 V, 3.33 Ω

89. When the relative permeability of a material is slightly more than 1, it is called as

(1) Diamagnetic material (2) Nonmagnetic material

(3) Ferromagnetic material (4) Paramagnetic material

90. The relationship between the line voltage and phase voltage of a star connected circuit is given by

(1) $V_L = V_{ph}$ (2) $V_L = 3\,V_{ph}$

(3) $V_L = \sqrt{3}\,V_{ph}$ (4) $V_L = \frac{V_{ph}}{3}$

91. Capacitance of a parallel plate capacitor is

(1) Directly proportional to area of the plates

(2) Inversely proportional to area of the plates

(3) Directly proportional to distance between plates

(4) Inversely proportional to permittivity of the dielectric

SPACE FOR ROUGH WORK

92. In a pure capacitive circuit current leads the voltage by

(1) π radians (2) $\frac{\pi}{2}$ radians

(3) $\frac{\pi}{4}$ radians (4) 0 radians

93. As per Flemings right hand rule, the direction of induced emf is given by the direction of

(1) Thumb (2) Middle finger

(3) Fore finger (4) Ring finger

94. The 10 W load adjustment in 1ϕ energy meter is done at

(1) 10% of full load current

(2) 20% of full load current

(3) 5% of full load current

(4) 30% of full load current

95. The power consumption least in _____ meter.

(1) Moving Iron type (2) Induction type

(3) PMMC type (4) Electrostatic type

96. The closeness with which instrument reading approaches the true value of the quantity being measured is

(1) Sensitivity (2) Accuracy

(3) Precision (4) Repeatability

97. Which of the following is correct with respect to Ammeter and Voltmeter ?

(1) Ammeters should be connected in parallel

(2) Voltmeters should be connected in series

(3) Ammeters should have low resistance

(4) Voltmeters should have low resistance

SPACE FOR ROUGH WORK

98. A transducer converts

(1) Mechanical displacement into electrical signal

(2) One form of energy into another form of energy

(3) Mechanical energy into electrical energy

(4) Electrical energy into mechanical form

99. A thermo couple is a

(1) Voltage generating transducers

(2) Variable resistance type transducers

(3) Variable capacitance type transducers

(4) Variable inductance types transducers

100. LVDT

(1) Converts electrical signal into linear motion

(2) Measuring high temperature

(3) Converts linear motion into electrical signal

(4) Used to measure frequency

101. The condition for maximum efficiency of a DC generator is

(1) Variable loss < constant loss

(2) Variable loss = constant loss

(3) Variable loss > constant loss

(4) Variable loss $\neq$ constant loss

102. A 4 pole wave wound DC generator with 50 slots, each slot containing 20 conductors driven at 1200 rpm, the flux per pole being 7×10^{-3} Wb. The voltage generated is

(1) 140 (2) 2800

(3) 560 (4) 280

SPACE FOR ROUGH WORK

103. The dummy coils in a DC machine are used to

(1) Increase efficiency (2) Improve commutation

(3) Mechanically balance armature (4) Reduce machine cost

104. Load saturation characteristics of a separatively excited DC generator give relation between

(1) V and I_f (2) V and I_a

(3) E_0 and I_a (4) E_0 and I_f

105. The current drawn by 120 V DC motor of armature resistance 0.5 Ω and back emf 110 V is _____ amperes.

(1) 20 (2) 24 (3) 21 (4) 5

106. The type of DC motor used for constant drive system is

(1) Series Motor (2) Shunt Motor

(3) Differential Compound Motor (4) Cummulative Compound Motor

107. The formula to find the short pitched winding factor is

(1) $\cos \alpha$ (2) $\sin \frac{\alpha}{2}$

(3) $\cos \frac{\alpha}{2}$ (4) $2 \cos \alpha$

108. The speed at which a 4-pole alternator should be driven to generate voltage at 50 Hz is

(1) 1000 rpm (2) 500 rpm

(3) 1500 rpm (4) 10000 rpm

109. The disadvantage of short pitched coil is

(1) Harmonics are introduced

(2) Voltage induced in the coil is reduced

(3) Waveform becomes non-sinusoidal

(4) Copper losses are increased

SPACE FOR ROUGH WORK

110. Which of the following condition is not required for parallel operation of alternators ?

(1) The terminal voltage of incoming alternator must be same as busbar voltage

(2) The speed of the incoming machine must be such that its frequency equals the busbar frequency

(3) The phase of the alternator voltage must be identical with the phase of the busbar voltage

(4) The rating of the incoming alternator should be same as the ratings of the existing alternators connected to the busbar

111. Which of the following is not an advantage of using 3-phase transformer over 3-single phase bank of transformers ?

(1) Less cost

(2) Less cost of standby units

(3) Less space

(4) Less weight

112. The open circuit test is conducted on a transformers to find

(1) Copper loss (2) Iron loss

(3) Friction loss (4) Total loss

113. The core of a transformer is laminated to reduce

(1) Leakage reactance (2) Eddy current loss

(3) Copper loss (4) Hysteresis loss

114. A transformer has a full load copper loss of 400 W. The upper loss at half full load will be

(1) 100 W (2) 200 W

(3) 50 W (4) 400 W

SPACE FOR ROUGH WORK

115. In a single phase induction motor, speed sensitive centrifugal switch is connected in _____ winding.

(1) Parallel with main (2) Series with main

(3) Series with starting (4) Parallel with starting

116. In a 3-phase induction motor, the speed of rotor is always _____ the synchronous speed.

(1) Independent of (2) Greater than

(3) Less than (4) Equal to

117. The starting torque of a Induction motor is maximum when rotor resistance per phase _____ rotor reactance per phase.

(1) Greater than (2) Lesser than

(3) Twice (4) Equal to

118. A 4 pole, 50 Hz single phase induction motor is running with a slip of 3.4%. The speed of rotor is

(1) 1500 rpm (2) 1540 rpm (3) 1449 rpm (4) 1279 rpm

119. The speed of synchronous motor can be changed by varying the

(1) Supply voltage (2) Field excitation

(3) Supply frequency (4) Load

120. Damper winding in a synchronous motor is used to

(1) Reduce losses (2) Improve power factor

(3) Vary speed (4) Start the motor

121. Pelton wheel is

(1) Inward flow impulse turbine (2) Outward flow impulse turbine

(3) Mixed flow reaction turbine (4) Tangential flow impulse turbine

SPACE FOR ROUGH WORK

122. The material used for control rod is

(1) Cadmium (2) Graphite

(3) Heavy water (4) Beryllium

123. The winds produced due to uneven heating and cooling of ground surfaces, oceans, rivers, hills etc are called

(1) Global winds (2) Local winds

(3) Planetary winds (4) Polar winds

124. The fuel used in fuel cell is

(1) Oxygen (2) Nitrogen

(3) Carbon (4) Hydrogen

125. The voltage of a single solar cell is about

(1) 0.5 V (2) 1.0 V (3) 1.2 V (4) 0.75 V

126. Which of the following is not used as working fluid in closed loop ocean thermal energy conversion ?

(1) Ammonia (2) Sodium chloride

(3) Freon (4) Propane

127. The main requirement of the insulating materials used for underground cable is

(1) Dielectric strength (2) Inflammable

(3) Hygroscopic (4) High permittivity

128. Energy efficient motors have

(1) High power factor (2) High noise

(3) High operating temperature (4) High vibration

SPACE FOR ROUGH WORK

129. Which one of the following is not an application of dielectric heating ?

(1) Diathermy (2) Gluing of wood

(3) Food processing (4) Annealing

130. The illumination at a surface due to a source of light placed at a distance 'd' from the surface varies as

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

131. Which of the following material is commonly used for the filaments in an incandescent lamps ?

(1) Nichrome (2) Tungsten

(3) Silver (4) Tantalum

132. The dielectric loss is proportional to

(1) $(\text{frequency})^{1/2}$ (2) frequency

(3) $(\text{frequency})^2$ (4) $(\text{frequency})^3$

133. Which of the following properties of a refrigerant is undesirable ?

(1) Low specific volume of vapour

(2) High latent heat of vaporisation

(3) Non toxic

(4) High boiling point

134. The greatest noise is produced in

(1) Oil circuit breaker (2) Vacuum circuit breaker

(3) Air blast circuit breaker (4) SF_6 circuit breaker

135. An example for a symmetrical fault is

(1) Single line to ground fault (2) Line to line fault

(3) 3-phase short circuit fault (4) Double line to ground fault

SPACE FOR ROUGH WORK

136. The transient voltage that appears across the contacts of circuit breaker at or near current zero during arcing period is called

(1) Arcing voltage (2) Restriking voltage

(3) Recovery voltage (4) Breaking voltage

137. Which of the following is true with respect to a fuse or circuit breaker ?

(1) A fuse performs both detection and interruption

(2) A circuit breaker performs both detection and interruption

(3) Fuse performs interruption only

(4) Circuit breaker performs detection only

138. The recovery voltage in a circuit breaker is maximum for a power factor of

(1) 0.5 (2) zero (3) 0.707 (4) unity

139. Earthing screen provides protection against

(1) Short circuit currents (2) Direct lighting strokes

(3) Indirect lighting strokes (4) Over load

140. Burden of a relay represents

(1) Volt-ampere rating of relay

(2) Current rating of relay

(3) Voltage rating of relay

(4) Power rating of relay in watts

141. A Zener diode is invariably used with

(1) Zero bias (2) Forward bias

(3) Reverse bias (4) None of the above

142. An amplifier output has a phase shift of

(1) 0° (2) 180° (3) 90° (4) 45°

SPACE FOR ROUGH WORK

143. A MOSFET and a capacitor is used as a memory cell in _____ memory.

(1) SRAM (2) DROM (3) ROM (4) DRAM

144. The efficiency of a full wave rectifier is

(1) 40.4% (2) 80.8% (3) 78.6% (4) 81.2%

145. Memory that does not loose its contents when the power is switched off is _____ memory.

(1) Volatile (2) Static

(3) Random (4) Non-volatile

146. The self destruction of a transistor due to increase in temperature is called

(1) Heat breakdown (2) Heat explosion

(3) Thermal runaway (4) Thermal expansion

147. The acronym LCD stands for

(1) Liquid Candle Display (2) Liquid Crystal Display

(3) Light Candle Device (4) Liquid Crystal Device

148. De Morgan's theorem states

(1) $\overline{(A+B)} = \overline{A}+\overline{B}$ (2) $\overline{AB} = \overline{A}+\overline{B}$

(3) $\overline{AB} = \overline{A} \oplus \overline{B}$ (4) $\overline{A+B} = \overline{AB}$

149. Half adder is made of _____ and _____ gates.

(1) EXOR and AND gates (2) EXNOR and AND

(3) EXOR and OR (4) EXNOR and OR

150. To serially shift a byte of data into a shift register, there must be

(1) 7 clock pulses (2) 8 clock pulses (3) 4 clock pulses (4) 5 clock pulses

SPACE FOR ROUGH WORK

151. In a synchronous counter

(1) All flip flops do not change state at the same time

(2) Output of a flip flop is given as clock to next flip flop

(3) All flip flops change state at the same time

(4) Clock input is not required for succeeding flip flops

152. The OR operation can be produced by using

(1) 3 NAND gates (2) 2 NAND gates

(3) 3 NOR gates (4) 4 NAND gates

153. The 2's complement of the binary number 0001 is

(1) 1110 (2) 1111 (3) 1010 (4) 0101

154. The Boolean expression A + BC = 1 when

(1) A = 1, B = 0, C = 0 (2) A = 0, B = 1, C = 0

(3) A = 0, B = 0, C = 1 (4) A = 0, B = 0, C = 0

155. A pattern of a voltage and current variations along a transmission line not terminated in its characteristic impedance results in

(1) Electric field (2) Radio wave

(3) Standing wave (4) Magnetic field

156. A Klystron is used as a

(1) Amplifier (2) Oscillator

(3) Mixer (4) Rectifier

157. A circular orbit around the equator with a 24 hour period is called

(1) Asynchronous orbit (2) Polar orbit

(3) Geostationary orbit (4) Transfer orbit

SPACE FOR ROUGH WORK

158. The operation of a fibre optic cable is based on the principle of

(1) Reflection (2) Refraction

(3) Dissipation (4) Absorption

159. In a Amplitude modulator, the LC tuned circuit functions as

(1) Mixer (2) Filter (3) Oscillator (4) Amplifier

160. The relationship between wavelength (λ) and frequency (f) is

(1) $\lambda = f^2$ (2) $\lambda = 2f$ (3) $\lambda = \frac{f}{(3\times10^8)}$ (4) $\lambda = \frac{3\times10^8}{f}$

161. MOSFET is a _____ controlled device.

(1) Current (2) Voltage

(3) Power (4) Temperature

162. The following is called as d.c. transformer

(1) Cycloconverter (2) Inverter (3) Chopper (4) GTO

163. In a voltage source inverter the following is connected at the input side of the inverter to maintain constant voltage

(1) Resistor

(2) Inductor

(3) Combination of resister and capacitor

(4) Capacitor

164. SCR is protected against $\frac{di}{dt}$ by

(1) Series inductor (2) Series capacitor

(3) Shunt capacitor (4) Combination of resistor and capacitor

165. Black out of power line disturbance means

(1) Over voltage (2) Harmonics

(3) Power outage (4) EMI

SPACE FOR ROUGH WORK

166. In the following regulator the output voltage polarity is opposite to that of input voltage

(1) Buck regulator (2) Buck-Boost regulator

(3) Boost regulator (4) Fly back dc-dc converter

167. In resistance-firing circuit the firing angle can be varied upto

(1) 90° (2) 270°

(3) 180° (4) 360°

168. In phase control, the load voltage is varied by varying

(1) Source voltage (2) Source current

(3) Firing angle (4) Using L and C components

169. Frequent starting and stopping of electric motors is required in

(1) Paper mills (2) Air conditioners

(3) Grinding mills (4) Lifts and hoists

170. Which of the following motors is used for elevators ?

(1) Synchronous motor

(2) Three phase induction motor

(3) Capacitor start single phase induction motor

(4) D.C. series motor

171. Which of the following motors are best for the rolling mills ?

(1) Single phase motors (2) Squirrel cage induction motors

(3) Slip ring induction motors (4) D. C. motors

172. In a paper mill, where constant speed is required, the preferred drive is

(1) Synchronous motor drive (2) Individual drive

(3) AC motor drive (4) Group drives

SPACE FOR ROUGH WORK

173. In which of the following co-efficient of adhesion decreases ?

(1) rust on the rails (2) dust on the rails

(3) sand on the rails (4) oil on the rails

174. The specification of G.I. earth plate is

(1) 60 cm × 60 cm × 3 mm

(2) 60 cm × 60 cm × 6 mm

(3) 60 cm × 60 cm × 4 mm

(4) 60 cm × 60 cm × 5 mm

175. The factor of safety used for current ratings in a power installation is

(1) 0.5 (2) 2 (3) 1.7 (4) 1

176. The maximum number of lighting points that can be connected in a circuit is

(1) 10 (2) 12 (3) 8 (4) 5

177. The length of cable required for single circuit of 66 kV transmission line running 80 km long with 3% sag is

(1) 250 km (2) 247.2 km (3) 240 km (4) 270 km

178. _____ is not a Green House Gas.

(1) Methane (2) Ozone (3) Oxygen (4) Carbon-di-oxide

179. Which of the following is more energy efficient ?

(1) Incandescent bulb (2) CFL

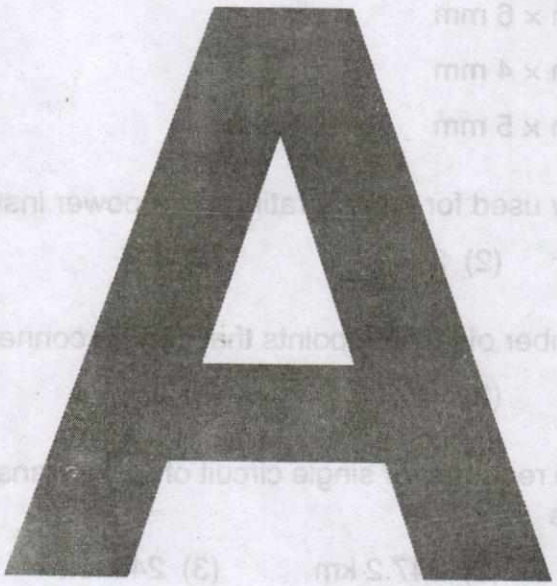
(3) Fluorescent tube light (4) LED

180. The reduction of utility load during peak demand is

(1) Peak loading (2) Peak clipping

(3) Load shifting (4) Valley filling

SPACE FOR ROUGH WORK



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