Group Code	COURSE
EC	**ELECTRONICS AND COMMUNICATION**

MAXIMUM MARKS	TOTAL DURATION	MAXIMUM TIME FOR ANSWERING
180	200 Minutes	180 Minutes

MENTION YOUR DIPLOMA CET NUMBER	BOOKLET VERSION CODE	SERIAL NUMBER
	A1	216913

EC – A1

DOs:

1. This question booklet is issued to you by the invigilator after the **2nd bell i.e., after 9.50 am.**
2. Check whether the DCET Number has been entered and shaded in the respective circles on the OMR answer sheet.
3. The version code and 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 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 am, till then;**
   - Do not remove the seal present on the right hand side of this question booklet.
   - Do not look inside this question booklet or start answering on the OMR answer sheet.

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. In case of usage of signs and symbols in the questions, the regular textbook connotation should be considered unless stated otherwise.
2. This question booklet contains 180 (items) questions and each question will have one statement and four different options / responses & out of which you have to choose one correct answer.
3. After the 3rd Bell is rung at 10.00 am, remove the paper seal on the right hand side 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.
4. 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 METHOD
(A) ● (C) (D)	⊗ (B) (C) (D) (A) (B) (C) ⊘ (A) ● ● (D)
	(A) (B) (C) (D) (A) ● (C) (D)

5. Please note that even a minute unintended ink dot on the OMR answer sheet will also be recognized and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.
6. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
7. **Last bell will ring at 1.00 pm,** stop marking on the OMR answer sheet.
8. Hand over the **OMR answer sheet** to the room invigilator as it is.
9. After separating the top sheet (Office copy), the invigilator will return the bottom sheet replica (candidate's copy) to you to carry home for self-evaluation.

PART - A

APPLIED SCIENCE

1. Which of the following is the supplementary unit of SI System?

   (A) Candela (B) Kelvin

   (C) Radian (D) Mole

2. The main scale of Slide Calipers is divided into millimeter, the length of Vernier is 19 mm and is divided into 20 equal parts. The least count is

   (A) 0.01 cm (B) 0.001 cm

   (C) 0.05 cm (D) 0.005 cm

3. Which one of the following is not a vector quantity?

   (A) Velocity (B) Acceleration

   (C) Speed (D) Force

4. The magnitude of resultant of two forces $\vec{P}$ and $\vec{Q}$ acting in the same line and in opposite direction is

   (A) P + Q (B) P – Q

   (C) $\frac{P}{Q}$ (D) $\frac{Q}{P}$

5. Two forces 3N and 5N are acting at a point making an angle of 60°. The magnitude of the resultant is

   (A) 15 N (B) 2 N

   (C) 7 N (D) 8 N

6. Torque produces

   (A) rotational motion (B) linear motion

   (C) both rotational and linear motion (D) neither rotational nor linear motion

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Space For Rough Work

7. Which one of the following is not related to couple?

(A) Kicking of football
(B) Opening and closing of tap
(C) Rotation of steering wheel
(D) Pedalling of bicycle

8. Within elastic limit, stress is

(A) independent of strain
(B) zero
(C) directly proportional to strain
(D) inversely proportional to strain

9. The length of a wire increases by 1% on suspending a load of 2 N from it. The tensile strain in the wire is

(A) 0.01
(B) 0.5
(C) 2
(D) 1

10. Pressure at any point inside a liquid

(A) remains zero
(B) increases with depth
(C) decreases with depth
(D) independent of depth

11. The pressure at the bottom of a swimming pool 20m wide and the water 2m deep (given density of water 1000 Kg/m^3 and $g = 10\ m/s^2$) is

(A) 2×10^3 Pa
(B) 40×10^3 Pa
(C) 10×10^3 Pa
(D) 20×10^3 Pa

12. In the case of liquids, as the temperature increases, the surface tension generally

(A) remains constant
(B) decreases
(C) increases
(D) zero

Space For Rough Work

13. The property of a liquid to oppose the relative motion between different layers is called

(A) density (B) elasticity

(C) viscosity (D) capillarity

14. An expression for coefficient of viscosity is (if F = viscous force; A = Area, V = difference in Velocity, x = distance between two layers)

(A) $\eta = -\frac{FA}{xV}$ (B) $\eta = -\frac{FV}{Ax}$

(C) $\eta = -\frac{Fx}{AV}$ (D) $\eta = -\frac{FxA}{V}$

15. The expression that represents Charle's law is

(A) PV = constant (B) VT = constant

(C) $\frac{P}{V}$ = constant (D) $\frac{V}{T}$ = constant

16. The pressure of a gas at 27°C is one atmospheric pressure. Keeping the volume constant, if the temperature is raised to 60°C, then its pressure will be

(A) 1.11 atmospheric pressure (B) 1.5 atmospheric pressure

(C) 2.2 atmospheric pressure (D) 2 atmospheric pressure

17. Hot water at 80°C will exchange heat with surroundings maintained at 25°C till the temperature of water becomes

(A) 80°C (B) 50°C

(C) 55°C (D) 25°C

18. Radiator in automobiles works on the principle of

(A) Conduction (B) Convection

(C) Radiation (D) Evaporation

Space For Rough Work

19. In the expression $C_p - C_v = R$, notation R represents

(A) Resultant force (B) Planck's constant

(C) Universal gas constant (D) Resonance

20. Physical quantity that represents the energy of the mechanical wave is

(A) Wave length (B) Frequency

(C) Amplitude (D) Wave period

21. Which one of the following is not an example of simple harmonic motion?

(A) Swinging of cradle (B) Oscillations of simple pendulum

(C) Vibrations of tuning fork (D) Motion of hands of clock

22. In the equation for velocity of sound in air, which of the following options does not hold good according to Laplace?

(A) Poor conductivity of air (B) Rapid pressure changes

(C) Maintaining constant temperature (D) Rise and fall of temperature

23. Distance between two consecutive nodes in a stationary wave is equal to

(A) Wavelength of individual wave (B) Difference of wavelengths of two waves

(C) Sum of wavelengths of two waves (D) Half of wavelength of individual wave

24. When the tension on the sonometer wire is increased by 15 N, its frequency is doubled. The original tension is

(A) Zero (B) 5 N

(C) 10 N (D) 15 N

Space For Rough Work

25. Two identical waves superpose on one another, then the beat frequency is

(A) Zero (B) One

(C) Ten (D) Infinity

26. Damage to the suspension bridge by marching military troops is due to

(A) Reverberation (B) Resonance

(C) Beats (D) Noise

27. A tuning fork produces waves in a medium. The parameter that changes with temperature of the medium is

(A) Wavelength (B) Frequency

(C) Amplitude (D) Period

28. The electromagnetic radiation used to detect the artificial gems from the original gems is

(A) Microwave (B) Radio wave

(C) Ultraviolet ray (UV ray) (D) X-ray

29. During excitation of an atom from ground state to excited state, the number of photons absorbed by the single atom is

(A) 2 (B) 1

(C) 3 (D) 0

30. In Nano-technology, the manipulation of atom is done in the range of

(A) 1 nano meter – 100 nano meter (B) 1 micro meter – 100 micro meter

(C) 1 pico meter – 100 pico meter (D) 1 millimeter – 100 millimeter

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Space For Rough Work

31. Live telecast of a programme can be viewed by

(A) Manual communication
(B) X-ray communication
(C) Landline communication
(D) Satellite communication

32. Optical Fibre is used in

(A) Endoscopy
(B) Biometric Machine
(C) Simple Microscope
(D) Simple Telescope

33. Acetic acid is an example for

(A) Strong Electrolyte
(B) Neutral Solution
(C) Weak Electrolyte
(D) Non-Electrolyte

34. The process of coating tin over iron and steel is known as

(A) Alloying
(B) Galvanizing
(C) Tinning
(D) Refining

35. The batteries which are recharged and reused are called

(A) Primary Battery
(B) Secondary Battery
(C) Fuel Cell
(D) Alkaline Battery

Space For Rough Work

36. PAFC is a type of

(A) Primary Cell (B) Secondary Cell

(C) Solar Cell (D) Fuel Cell

37. The easily fusible material which is formed when Flux reacts with gangue is

(A) Slag (B) Alloy

(C) Polymer (D) Mineral

38. Which of the below given polymers is obtained by condensation polymerization?

(A) Poly ethene (B) Nylon

(C) PVC (D) Poly propane

39. Which of the following is not a composite material?

(A) Fibreglass (B) Concrete

(C) Ceramic (D) Bronze

40. The pH value of Lemon juice is about

(A) 2.4 (B) 8.2

(C) 10.2 (D) 14

Space For Rough Work

PART – B

ENGINEERING MATHEMATICS

41. The value of $\begin{vmatrix} \cos 50^\circ & \sin 10^\circ \\ \sin 50^\circ & \cos 10^\circ \end{vmatrix}$ is

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

(C) $\frac{-1}{2}$ (D) $\frac{1}{2}$

42. The values of x & y from the simultaneous equations $3x + 4y = 7$ and $7x - y = 6$ are.

(A) $x = 1, y = 1$ (B) $x = -1, y = -1$

(C) $x = 1, y = -1$ (D) $x = -1, y = 1$

43. If $\begin{vmatrix} x & 3 \\ 3 & x \end{vmatrix} = 0$ then the value of x is

(A) ± 1 (B) ± 3

(C) ± 9 (D) $\pm \sqrt{6}$

44. If $A = \begin{bmatrix} -1 & 3 \\ 4 & -5 \end{bmatrix}$, then $2A^T$ is

(A) $\begin{bmatrix} -2 & 6 \\ 8 & -10 \end{bmatrix}$ (B) $\begin{bmatrix} -1 & 4 \\ 3 & -5 \end{bmatrix}$

(C) $\begin{bmatrix} -2 & 8 \\ 6 & 8 \end{bmatrix}$ (D) $\begin{bmatrix} -2 & 8 \\ 6 & -10 \end{bmatrix}$

Space For Rough Work

45. If A is a given square Matrix then

(A) $\text{adj } A = \frac{A^{-1}}{|A|}$ (B) $\text{adj } A = \frac{|A|}{|A^{-1}|}$

(C) $\text{adj } A = |A| . A^{-1}$ (D) $AA^{-1} = \text{adj } A . |A|$

46. The characteristic Equation of the Matrix $A = \begin{bmatrix} -5 & 6 \\ -2 & 1 \end{bmatrix}$ is

(A) $\lambda^2 - 6\lambda + 12 = 0$ (B) $\lambda^2 - 4\lambda + 17 = 0$

(C) $\lambda^2 + 4\lambda + 7 = 0$ (D) $\lambda^2 - 4\lambda + 7 = 0$

47. The unit vector in the direction of $\vec{a} = 3i + 4j - 2k$ is

(A) $\hat{a} = \frac{3i + 4j - 2k}{\sqrt{26}}$ (B) $\hat{a} = \frac{3i + 4j - 2k}{\sqrt{29}}$

(C) $\hat{a} = i + j - 2k$ (D) $\hat{a} = \frac{3i + 4j - 2K}{\sqrt{21}}$

48. If $\vec{a} = i + \lambda j$ and $\vec{b} = 2j + 3k$ and $\vec{a} . \vec{b} = 0$ then 'λ' is Equal to

(A) $\frac{-2}{3}$ (B) $\frac{2}{3}$

(C) $\frac{3}{2}$ (D) 0

49. Area of the triangle whose adjacent sides are $\vec{a} = 2i - j + 2k$ and $\vec{b} = 3i - j$ is

(A) $\sqrt{41}$ sq.units (B) $\frac{\sqrt{41}}{2}$ sq.units

(C) $\frac{3}{2}$ sq. units (D) $\frac{\sqrt{65}}{2}$ sq.units

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Space For Rough Work

50. The number of possible outcomes in the sample space when two dice of different colours are rolled is

(A) 36 (B) 6

(C) 9 (D) 12

51. Sin θ is positive and tan θ is negative when θ is in

(A) I quadrant (B) II quadrant

(C) III quadrant (D) IV quadrant

52. The value of

$$\frac{\tan(\pi-\alpha)}{\tan(-\alpha)} + \frac{\cos(\pi/2-\alpha)}{\sin(2\pi-\alpha)} + \frac{\operatorname{cosec}\left(\frac{3\pi}{2}+\alpha\right)}{\sec(\pi+\alpha)}$$ is

(A) – 1 (B) 2

(C) – 2 (D) 1

53. The value of sin (105°) is

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

(C) $\frac{1-\sqrt{3}}{2\sqrt{2}}$ (D) $\frac{\sqrt{3}}{2\sqrt{2}}$

54. The value of $\frac{1-\cos A+\sin A}{1+\cos A+\sin A}$ is

(A) tan A (B) tan $(A/2)$

(C) cot $(A/2)$ (D) cot A

55. If $\sin A = \frac{1}{3}$, then the value of sin 3A is

(A) $-3/27$ (B) 1

(C) $\frac{-4}{27}$ (D) $\frac{23}{27}$

Space For Rough Work

56. The value of 2 cos 3A. sin 2A is

(A) sin 5A + sin A

(B) cos 5A + cos A

(C) sin 5A – sin A

(D) cos 5A – cos A

57. The polar form of 1 + i is

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

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

(C) $\sqrt{2}\left[\sin\pi/4 + i\cos\frac{\pi}{4}\right]$

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

58. $\lim_{x \to -3} \frac{x^2 - 5x + 6}{x^2 - 3x} =$

(A) $\frac{-5}{3}$

(B) $\frac{1}{3}$

(C) $\frac{-1}{3}$

(D) $\frac{5}{3}$

59. $\lim_{x \to a} \frac{\sqrt{x^3} - \sqrt{a^3}}{x - a} =$

(A) $\frac{3}{2}\sqrt{a}$

(B) $\frac{3}{2\sqrt{a}}$

(C) $\sqrt{a}$

(D) $\frac{1}{\sqrt{a}}$

60. $\lim_{\theta \to 0} \frac{\cos 3\theta - \cos\theta}{\theta \sin 2\theta} =$

(A) tan 2θ

(B) 2

(C) –2

(D) 1

Space For Rough Work

61. Equation of the straight line passing through the point (1, 3) and having slope – 2 is

(A) $2x - y + 5 = 0$ (B) $x + 2y + 5 = 0$

(C) $x - 2y - 5 = 0$ (D) $2x + y - 5 = 0$

62. Equation of the straight line passing through the origin and perpendicular to the line $5x - 4y - 1 = 0$ is

(A) $5x - 4y = 0$ (B) $4x + 5y = 0$

(C) $5x - 4y + 1 = 0$ (D) $4x + 5y + 1 = 0$

63. If $y = \frac{x^2 - 5}{x^2 + 3}$, then $\frac{dy}{dx} =$

(A) $\frac{4x^3 - 4x}{(x^2 + 3)^2}$ (B) $\frac{16x}{(x^2 + 3)^2}$

(C) $\frac{4x}{(x^2 + 3)^2}$ (D) $\frac{-16x}{(x^2 + 3)^2}$

64. If $y = \sin^{-1} (\cos x)$, then $\frac{dy}{dx} =$

(A) $\frac{1}{\sqrt{1 - x^2}}$ (B) $\frac{-\sin x}{\sqrt{1 - x^2}}$

(C) 1 (D) – 1

65. If $y = \sqrt{y \log x}$, then $\frac{dy}{dx} =$

(A) $\frac{1}{x(2y - 1)}$ (B) $\frac{1}{x}$

(C) $\frac{1}{x(1 - 2y)}$ (D) $\frac{1}{xy}$

Space For Rough Work

66. If $x = a\cos^2\theta$ and $y = b\sin^3\theta$, then $\frac{dy}{dx}$ =

(A) $-\frac{3b}{2a}\sin\theta$ (B) $-\frac{3b}{2a}$

(C) $\frac{2a}{b}\cos\theta$ (D) $\frac{-2a}{3b\sin\theta}$

67. If $y = x^y$, then $\frac{dy}{dx}$

(A) $\frac{y^2}{x(1-\log x)}$ (B) $\frac{y^2}{x(1+\log y)}$

(C) $\frac{y^2}{x\ (1-y\ \log x)}$ (D) $\frac{y^2}{x(1+\log x)}$

68. If $y = \sin^2 x$, then $\frac{d^2y}{dx^2}$ =

(A) 2 cos 2x (B) 2 sin 2x

(C) 2 sin x cos x (D) 2x sin x

69. The Equation of tangent to the curve y = sin x at the point $(\pi, 0)$ is

(A) $x + y + 1 = 0$ (B) $x - y - 1 = 0$

(C) $x + y - \pi = 0$. (D) $x - y + \pi = 0$.

70. The rate of change of radius of the sphere is 9cm/s. Then the rate of change of volume of the sphere when the radius is 2 cm is equal to

(A) $144\pi\ cm^3/s$ (B) $9\pi\ cm^3/s$

(C) $56\pi\ cm^3/s$ (D) $64\pi\ cm^3/s$

Space For Rough Work

71. $\int \frac{1}{1+\cos x}\,dx =$

(A) $\tan x + \sec x + c$ (B) $\tan x - \sec x + c$

(C) $-\cot x + \operatorname{cosec} x + c$ (D) $\cot x - \operatorname{cosec} x + c$

72. $\int \left(\sqrt{x} + \cot x\right) dx =$

(A) $\frac{2}{3} x^{3/2} + \log \sin x + c$ (B) $\frac{3}{2} x^{2/3} + \log \sec x + c$

(C) $\frac{2}{3} x^{3/2} - \log \sin x + c$ (D) $\frac{3}{2} x^{2/3} - \log \sec x + c$

73. $\int \frac{e^{\log x}}{x}\,dx =$

(A) $e^x + c$ (B) $\log (e^x) + c$

(C) $x \log e^x + c$ (D) $e^{\log x} + c$

74. $\int \log x . dx =$

(A) $x \log x + x + c$ (B) $x \log x - x + c$

(C) $x + \log x + c$ (D) $x - \log x + c$

75. $\int \frac{x}{\sqrt{1+x^2}}\,dx =$

(A) $\sqrt{1+x^2} + c$ (B) $\sqrt{1-x^2} + c$

(C) $\frac{1}{\sqrt{1+x^2}} + c$ (D) $\frac{1}{\sqrt{1-x^2}} + c$

Space For Rough Work

76. $\int_{-2}^{1} (x + 1)(x - 1)\, dx =$

(A) 0 (B) 1

(C) – 1 (D) – 2

77. The area bounded by the curve $y = \sin^2 x$, the x–axis and the ordinates $x = 0$ and $x = \pi/2$ is

(A) $\frac{\pi}{4}$ sq. units (B) $\frac{\pi}{2}$ sq. units

(C) $\frac{\pi}{3}$ sq. units (D) $\frac{\pi}{6}$ sq. units

78. The order and degree of a differential equation $4\left(\frac{dy}{dx}\right)^3 + 8xy + \left(\frac{d^2y}{dx^2}\right)^2 - 7 = 0$ respectively are

(A) 1 and 3 (B) 2 and 2

(C) 2 and 3 (D) 2 and 1

79. The differential equation formed from the equation $y^2 = 4ax$ by eliminating arbitrary constant is

(A) $2x\frac{dy}{dx} - y = 0$ (B) $2x\frac{dy}{dx} + y = 0$

(C) $y\frac{dy}{dx} - 2x = 0$ (D) $y\frac{dy}{dx} + 2x = 0$

80. For the differential equation $\frac{dy}{dx} + (\tan x).\, y = \cos x$, the integrating factor is

(A) log x (B) cot x

(C) cosec x (D) sec x

Space For Rough Work

PART – C
ELECTRONICS AND COMMUNICATION

81. Ohm's law is applicable for the following cases.

(A) Electrolytes (B) Conductors

(C) Insulators (D) Vacuum tubes

82. Three resistors of values 3Ω, 4Ω and 5Ω are connected in series. 12V dc supply is connected across this network, then current flowing through 4Ω resistor is

(A) 5 mA (B) 10 mA

(C) 1 mA (D) 3 mA

83. Equivalent capacitance $C = C_1 + C_2 + C_3$ is applicable to the following circuits.

(A) Series combination of 3 – capacitance

(B) Series combination of 3 – conductance

(C) Parallel combination of 3 – capacitance

(D) Parallel combination of 3 – conductance

84. In a DC circuit 3-inductances L_1, L_2, and L_3 are connected in series. Equivalent inductance 'L' is given by

(A) $L = \frac{1}{L_1} + \frac{1}{L_2} + \frac{1}{L_3}$ (B) $\frac{1}{L} = L_1 + L_2 + L_3$

(C) $L = L_1 + L_2 + L_3$ (D) $\frac{1}{L} = \frac{1}{L_1} + \frac{1}{L_2} + \frac{1}{L_3}$

85. Equation for energy stored in inductor is given by

(A) $W(t) = \frac{1}{2Li^2(t)}$ (B) $W(t) = \frac{1}{2} Li^2(t)$

(C) $W(t) = \frac{1}{2} \frac{L}{i^2(t)}$ (D) $W(t) = \frac{1}{2} \frac{i^2(t)}{L}$

Space For Rough Work

86. Reactance in an inductive circuit will

(A) Increase with frequency
(B) Decrease with frequency
(C) Independent on applied voltage
(D) Depends on applied voltage.

87. A Resistor's first three colour bands are "Yellow-Violet-Brown" from left to right. What is the resistance value? Neglect tolerance.

(A) 540 Ω
(B) 460 Ω
(C) 470 Ω
(D) 470 k Ω

88. A stepdown transformer will

(A) Increase the current in secondary
(B) Increase the voltage in secondary
(C) Increase the power in secondary
(D) Decrease the voltage in secondary.

89. At absolute zero temperature semiconductor behaves as

(A) Conductor
(B) Insulator
(C) Semiconductor
(D) Short circuit

90. Diode used as a Voltage Regulator is

(A) Varactor diode
(B) GUNN diode
(C) PIN diode
(D) Zener diode

91. Find the value of α if $\beta = 5.67$

(A) 0.95
(B) 0.85
(C) 0.75
(D) 0.65

92. For a BJT transistor in CE configuration if it has to work as an amplifier,

(A) BE junction is forward-biased and CE junction is reverse-biased
(B) Both BE junction and CE junction are forward-biased
(C) Both BE junction and CE junction are reverse-biased
(D) BE junction is reverse-biased and CE junction forward-biased.

Space For Rough Work

93. Varactor diode is used as

(A) VCO (B) Resistor

(C) VRO (D) Inductor

94. Semiconductor material used in LED is

(A) Gallium arsenide (B) Indium phosphorus

(C) Potassium carbonate (D) Silicon

95. Efficiency of ideal full wave rectifier is

(A) 90.2% (B) 100%

(C) 81.2% (D) 40.6%

96. SMPS works mainly on the basis of

(A) PAM (B) PWM

(C) PCM (D) PSM

97. The point of intersection of DC and AC load line is called

(A) Saturation point (B) Cut-off point

(C) Operating point (D) None of the above

98. A feedback circuit usually employs _____ network.

(A) Resistive (B) Diode

(C) Transistor (D) SCR

99. The ratio of differential voltage gain Ad to the common mode voltage gain A_{cm} is called (A_d/A_{cm})

(A) PSRR (B) CMRR

(C) Slew rate (D) Voltage gain

Space For Rough Work

100. The op-amp can amplify

(A) AC signals only (B) DC signals only

(C) Both AC and DC signals (D) Neither AC nor DC

101. The important feature of Phase Locked Loop (PLL) is

(A) It provides stable O/P frequency

(B) Its O/P frequency will be locked to an input frequency

(C) Its O/P frequency can be determined by crystal

(D) Its O/P frequency is not affected by changes in supply voltage.

102. Barkhausen criterion for oscillator is

(A) $A\beta = 0$ (B) $A\beta = 1$

(C) $A\beta = -1$ (D) $A = \frac{1}{\sqrt{\beta}}$

103. An SCR has _____ semiconductor layers

(A) Two (B) Three

(C) Four (D) None

104. A single phase fully Controlled Bridge rectifier uses

(A) 2 SCRs (B) 4 SCRs

(C) 3 SCRs (D) 6 SCRs

105. If 'T' is the time period for a chopper circuit and 'a' is its duty cycle, then the chopping frequency is

(A) $\frac{T_{on}}{a}$ (B) $\frac{T_{off}}{a}$

(C) $\frac{a}{T_{off}}$ (D) $\frac{a}{T_{on}}$

Space For Rough Work

106. Which of the following Inverters allows multimotor operation?

(A) Voltage source inverter (B) Current source inverter

(C) Both VSI and CSI (D) None of the above

107. _____ cycloconverter requires forced commutation

(A) Stepdown cycloconverter

(B) Stepup cycloconverter

(C) Single phase to single phase cycloconverter

(D) All of the above

108. HMI stands for

(A) Human Model Interface (B) Human Machine Interface

(C) Hirarchial Model Interface (D) Higher Machine Interface

109. An OR function implemented in ladder logic uses

(A) Normally-closed contacts in series (B) Normally-open contacts in series

(C) Normally-closed contactin parallel (D) Normally-open contact in parallel

110. 8051 microcontroller has _____ byte RAM on chip

(A) 80 (B) 128

(C) 258 (D) 512

111. Which of the following pin is used to demultiplex address bus and data bus when external memory is interfaced in 8051.

(A) $\overline{\text{PSEN}}$ (B) RST

(C) ALE (D) $\overline{\text{EA}}$

112. In 8051 Bit addressable memory in RAM area is assigned in the range of

(A) 20 H to 2 FH (B) 00 to 1 FH

(C) 30 H to 7 FH (D) 00 to 7 FH

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113. In 8051 when DIV AB instruction is executed remainder is stored in _____ register.

(A) A (B) B

(C) R_0 (D) R_1

114. To access the bit addressable RAM in 8051C data type used is

(A) Unsigned char (B) S bit

(C) bit (D) sfr

115. The special function register used to set the interrupt priority is

(A) IE (B) IP

(C) TMOD (D) SCON

116. In 8051 special function register to hold data for serial communication is

(A) TMOD (B) TCON

(C) SBUF (D) SCON

117. A Thevenin equivalent circuit always consists of

(A) A voltage source and a Series Resistance

(B) A voltage source and a Parallel Resistance

(C) A current source and a Parallel Resistance

(D) A current source and a Series Resistance

118. For maximum power to be transferred from a source to load in a network, the load resistance must be _____ the thevenin resistance.

(A) greater than (B) less than

(C) equal to (D) not equal to

119. Current is minimum or zero in a tuned circuit where

(A) L and C are in series (B) L and C are in parallel

(C) R and L are in series (D) C and R are in parallel

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120. Resonant frequency equation for parallel resonance is

(A) $f_p = \frac{1}{2\pi}\sqrt{\frac{1}{R_L} - \frac{C^2}{R^2}}$

(B) $f_p = \frac{1}{2\pi}\sqrt{\frac{1}{LC} - \frac{R^2}{L^2}}$

(C) $f_p = \frac{1}{2\pi}\sqrt{\frac{1}{RC} - \frac{L^2}{R^2}}$

(D) $f_p = \frac{1}{2\pi}\sqrt{\frac{1}{RC} - \frac{R^2}{C^2}}$

121. Design equation for shunt element of a constant-K High Pass Filter is

(A) $\frac{R_o}{4\pi f_c}$

(B) $\frac{4\pi}{R_o f_c}$

(C) $\frac{f_c}{4\pi R_o}$

(D) $\frac{\pi}{4 f_c R_o}$

122. Reflecion coefficient in terms of load impedance Z_L and characteristic impedance Z_o is

(A) $|K| = \frac{Z_o + Z_L}{Z_o - Z_L}$

(B) $|K| = \frac{Z_L - Z_o}{Z_L + Z_o}$

(C) $|K| = \frac{2Z_o - Z_L}{Z_L - Z_o}$

(D) $|K| = \frac{2Z_L + Z_o}{Z_o + Z_L}$

123. In the following A M equation

$v = V_c \sin w_c t + \frac{M_a V_c}{2}\cos(w_c - w_m)t \quad \frac{-M_a V_c}{2}(w_c + w_m)t$ USB is represented by

(A) $V_c \sin W_c t$

(B) $\frac{M_a V_c}{2}\cos(W_c - W_m)t$

(C) $\frac{M_a V_c}{2}(W_c + W_m)t$

(D) $\frac{M_a V_c}{2}\left[\cos(W_c - W_m)t + \cos(W_c + W_m)t\right]$

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124. A NAND gate's output is low if

(A) all inputs are low. (B) all inputs are high.

(C) any one input is low. (D) any one input is high.

125. Which of the example below expresses the distributive low of Boolean algebra?

(A) $A * (B * C) = (A * B) + C$ (B) $A + (B + C) = (A * B) + (A * C)$

(C) $A * (B + C) = (A * B) + (A * C)$ (D) $(A + B) + C = A + (B + C)$

126. Applying Demorgan's theorem to the expression $\overline{ABC}$ we get.

(A) $\overline{A} + \overline{B} + \overline{C}$ (B) $\overline{A + B + C}$

(C) $A + \overline{B} + \overline{C}$ (D) $\overline{A}\ (B + C)$

127. The 2's complement of $110110_{(2)}$ is _____

(A) $110100_{(2)}$ (B) $101010_{(2)}$

(C) $001011_{(2)}$ (D) $001010_{(2)}$

128. Half adder has _____ inputs and _____ outputs.

(A) 2, 1 (B) 3, 1

(C) 3, 2 (D) 2, 2

129. Race around problem is overcome in

(A) SR flip-flop (B) D flip-flop

(C) Master slave J K flip-flop (D) JK flip-flop

130. A 6 bit DAC has a step size of 20 mV. Determine the full scale output voltage.

(A) 3.15 V (B) 1.26 V

(C) 6.02 V (D) 2.60 V

131. _____ RAM must be refreshed many times per second.

(A) Dynamic (B) Static

(C) Non-volatile (D) CD

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132. Band rate is defined as the _____

(A) Number of symbols transmitted per second.

(B) Number of bits transmitted per second.

(C) Number of packets transmitted per second.

(D) Number of frames transmitted per second.

133. The noise which is introduced in the transmitter and carried all the way along to the receiver output is called as _____

(A) Channel noise (B) Quantization noise

(C) Cross talk noise (D) Transit time noise

134. _____ system adjusts its step size according to signal characteristics

(A) DM (B) ADM

(C) DPCM (D) PCM

135. In a positive logic, if a 1 is represented by +A volts and 0 is represted by –A volts, then it is called _____

(A) Bipolar format (B) Unipolar format

(C) Non-polar format (D) Polar format

136. _____ involves switching the amplitude of a sinusoidal carrier between 2 values in accordance with the incoming binary data while keeping the frequency and phase constant.

(A) BFSK (B) BPSK

(C) BASK (D) DPSK

137. _____ shares a single carrier frequency with several users by dividing the transmission time into non-overlapping slots.

(A) FDMA (B) FDM

(C) TDMA (D) CDMA

138. Light is used as a carrier for information in _____

(A) Twister pair cables (B) Coaxial cables

(C) Fibre optic cables (D) Air

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139. _____ requires both the stations must be available at the same time for the data exchange.

(A) Message switching (B) Circuit switching

(C) Packet switching (D) Connectionless switching

140. Segmentation and Reassembly is done in _____ of O.S.I. model

(A) Transport layer (B) Presentation layer

(C) Network layer (D) Datalink layer

141. Self healing mechanism is used in _____ network.

(A) Token Bus (B) Token Ring

(C) FDDI (D) Ethernet

142. In _____ method server assigns a physical address to the computer everytime it boots.

(A) Dynamic address (B) Static address

(C) Configurable address (D) Class F address

143. _____ connects two separate LANS that use the same media access protocol.

(A) Routers (B) Bridge

(C) Gateway (D) Repeaters

144. A character variable can at a time store

(A) 1 character (B) 8 characters

(C) 254 characters (D) None of the above

145. What will be the output for the given below program main ( )?

```
{
    int x = 20, y = 30;
    if (x = = y)
    Print f (" % d % d ",  x, y);
}
```

(A) 20, 30 (B) Garbage value

(C) 10, 20 (D) Prints nothing

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146. Within a switch statement

(A) Continue cannot be used but break can be used.

(B) Continue can be used but break cannot be used.

(C) Neither continue nor break can be used.

(D) Both continue and break can be used.

147. MAT LAB is a _____ .

(A) Low level language (B) High level language

(C) Not a language (D) None of the above

148. _____ command is used to generate output

(A) Output (B) disp

(C) Print (D) Printf

149. Which of the following will correctly define x as a symbol?

(A) Sym (x) (B) Syms x

(C) Syms (x) (D) Sym x

150. Link Register (L_r) in ARM controller is used to put _____ .

(A) The head of stack (B) The return address

(C) The address of next instruction (D) The content of CPSR

151. ADD R_0, R_1, R_2 instructions perform the following operation.

(A) $R_0 = R_1 + R_2$ (B) $R_2 = R_0 + R_1$

(C) $R_1 = R_0 + R_2$ (D) $R_0 = R_0 + R_1$

152. Which statement is false for thumb instructions?

(A) Separate shift instructions exist (B) All instructions executed unconditionally

(C) MSR and MRS instructions are available (D) There are no coprocessor instructions

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153. The LPC 2148 provides _____ bytes of static RAM

(A) 8 K (B) 16 K

(C) 32 K (D) 64 K

154. Register used to set the direction of port pin is

(A) IO DIR (B) IO PIN

(C) DIRIO (D) IOCLR

155. Brown out protection circuit is a timing circuit

(A) That prevents the processor from unexpected halt when supply voltage falls below the specified voltage.

(B) That resets the system processor when the program execution hangs up.

(C) That it resets when supply voltage raises above specific voltage.

(D) It resets when processor temperature rises.

156. MSP430 has _____ bit wide data bus and address bus.

(A) 8 (B) 16

(C) 32 (D) 64

157. MSP 430 has _____ number of core instructions

(A) 27 (B) 35

(C) 50 (D) 75

158. Which one of the following instructions is an example for Indirect addressing model

(A) ADD R5, R6 (B) ADD @R5, R6

(C) ADD # 1320H, R6 (D) ADD 10 (R5), 65 (R6)

159. In MSP 430 _____ Register is used to select the direction of I/O pins

(A) PXDIR (B) PXIN

(C) PXREN (D) PXSEL

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160. Any Hardware at any Hardware level can be defined by

(A) Digital Description Language
(B) Hardware Description Language
(C) Level Description Language
(D) High Description Language

161. Symbol 'z' represents _____ in Verilog.

(A) Logic ONE
(B) True condition
(C) High impedance state
(D) Logic ZERO

162. The construct that keeps on executing all times of simulation is called _____ construct

(A) Behavioral
(B) Always
(C) Initial
(D) Conditional

163. The frequency range for K-Band in microwave frequency range is

(A) 5.2 – 10.9 GHz
(B) 10.9 – 36 GHz
(C) 36 – 46 GHz
(D) 46 – 56 GHz

164. In Transverse Magnetic (TM) mode

(A) Electric field is perpendicular to the direction of wave propagation.
(B) Magnetic field is parallel to the direction of wave propagation.
(C) Magnetic field is perpendicular to the direction of wave propagation.
(D) Electric field and magnetic field, both are parallel to the direction of wave propagation.

165. The Doppler frequency shift is given by the equation

(A) $fd = 2 v_r \lambda$
(B) $fd = \frac{\lambda}{2v_r}$
(C) $fd = \frac{2v_r}{\lambda}$
(D) $fd = \frac{1}{2v_r \lambda}$

166. A geostationary satellite has an inclination of

(A) Zero degree
(B) 90 degree
(C) 120 degree
(D) 180 degree

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167. In Interactive Data Communication using Satellite, VSAT stands for

(A) Very Strong Aperture Terminal
(B) Very Small Aperture Terminal
(C) Very Small Adaptive Transmitter
(D) Virtual Satellite

168. _____ provides intersystem roaming

(A) FNR
(B) IWF
(C) ILR
(D) EIR

169. The Mobile Station (MS) moves from one Base Station Controller (BSC) to another (BSC). But same Mobile Switching Centre (MSC) then Handoff performed is

(A) Intra-cell Handoff
(B) Inter-cell Intra BSC Handoff
(C) Inter-BSC, Intra-MSC Handoff
(D) Inter MSC Handoff

170. Data entered into the calculator and the result of operation are stored in

(A) RAM
(B) ROM
(C) Registers
(D) Display unit

171. CDI system means

(A) Capacitor discharge ignition
(B) Compact disc interface
(C) Common data interface
(D) Charge device interface

172. Ribbon microphone is a type of _____

(A) Velocity microphone
(B) Pressure microphone
(C) Temperature microphone
(D) Humidity microphone

173. The following projector passes light through panels.

(A) LED Projector
(B) DLP Projector
(C) LCD Projector
(D) OHP Projector

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174. Deviation of measured value from true value is called

(A) Error (B) Sensitivity

(C) Accuracy (D) Expected value

175. Maxwell bridge is used for measurement of

(A) Resistance (B) Inductance

(C) Capacitance (D) Frequency

176. A transducer that does not require an external power source for its operation is called _____

(A) Active transducer (B) Both active and passive transducer

(C) Passive transducer (D) None of the above

177. Measurement in the cryogenic range is done using

(A) Resistance (B) Thermistor

(C) Thermocouple (D) Hall effect

178. In the PMMC meter the scale is _____

(A) Logarithmic (B) Linear

(C) Synosoidal (D) Tangential

179. A DC voltmeter is constructed using

(A) A PMMC meter and a shunt resistance (B) Two parallel resistances

(C) A PMMC meter and a series resistance (D) Two series resistances

180. A CRT Screen is coated with _____ material

(A) Phosphor (B) Silver

(C) Zinc (D) Aluminium

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