DIPLOMA - COMMON ENTRANCE TEST-2017

EC	COURSE	DAY : SUNDAY DATE : 02-07-2017
	ELECTRONICS AND COMMUNICATION	TIME : 10.00 a.m. to 1.00 p.m.

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

MENTION YOUR DIPLOMA CET NUMBER					QUESTION BOOKLET DETAILS	
					VERSION CODE	SERIAL NUMBER
					D - 1	220076

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 **2nd 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 **3rd Bell rings at 10.00 a.m., till then;**
   - Do not remove the paper seal / polythene bag of this question booklet.
   - Do not look inside this question booklet.
   - Do not start answering on the OMR answer sheet.

CONFIDENTIAL

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 / polythene bag 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 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 :

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. Handover the **OMR ANSWER SHEET** to the room invigilator as it is.
7. After separating the top sheet (KEA 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.**

PART – A

APPLIED SCIENCE

1. The property of light that Huygen's wave theory could explain is

   (A) Polarisation (B) Photoelectric effect

   (C) Interference (D) Compton effect

2. The spectrum of black body radiation is successfully explained by

   (A) Newton's corpuscular theory of light

   (B) Huygen's wave theory of light

   (C) Maxwell's electromagnetic theory of light

   (D) Planck's quantum theory of light

3. For constructive interference of light, the path difference should be

   (A) $\frac{2n\lambda}{2}$ (B) $(2n+1)\frac{\lambda}{2}$

   (C) $(2n+1)\frac{\lambda}{3}$ (D) $(2n+1)\frac{\lambda}{4}$

4. Two very close objects are just resolved if the central maximum of one object is on

   (A) central maximum of another

   (B) first minimum of another

   (C) beyond second minimum of another

   (D) between central maximum and first minimum of another

5. The light is incident at polarising angle θ_p and the angle of refraction is r, then

   (A) $\theta_p + r = 0°$ (B) $\theta_p + r = 90°$

   (C) $\theta_p + r = 180°$ (D) $\theta_p + r = 360°$

Space For Rough Work

6. Minimum energy required to remove an electron from the metal surface is called

(A) Kinetic energy (B) Potential energy

(C) Work function (D) Energy function

7. When the size of the scattering particle is small, the intensity of scattered light is inversely proportional to

(A) fourth power of wavelength (B) square of wavelength

(C) square root of wavelength (D) cube of wavelength

8. Time for which an atom stays in metastable state is of the order of

(A) Seconds (B) Milli-seconds

(C) Micro-seconds (D) Nano-seconds

9. If an element emits β-ray then its atomic number

(A) increases by one (B) decreases by one

(C) remains same (D) decreases by two

10. If the concentration of H^+ ions is more than 10^{-7} gm ion per litre, the solution is

(A) Base (B) Acid

(C) Neutral (D) Both Acid and Base

11. A galvanic cell is one in which

(A) chemical energy produce electric energy

(B) electric energy produce chemical energy

(C) chemical energy will not produce electric energy

(D) electric energy will not produce chemical energy

Space For Rough Work

12. The S.I. unit of Coefficient of Viscosity is

(A) Poise (B) NSm^{-2}

(C) $NS^{-1}m^2$ (D) $NS^{-1}m^{-2}$

13. The prefix used for 10^{+9} is

(A) Mega (B) Tera

(C) Giga (D) Hecta

14. The physical quantity which has the dimensional formula $[ML^0T^{-2}]$ is

(A) Force (B) Surface tension

(C) Viscosity (D) Work

15. The least count of slide callipers is given by

(A) 1 MSD + 1 VSD (B) 1 MSD × 1 VSD

(C) 1 MSD – 1 VSD (D) $\frac{1\text{ MSD}}{1\text{ VSD}}$

16. The product of force and time is

(A) Momentum (B) Moment

(C) Impulse (D) Acceleration

17. The change in position of a particle in a particular direction is referred to as

(A) Speed (B) Displacement

(C) Velocity (D) Acceleration

Space For Rough Work

18. The equation of motion of a body for distance travelled 'S_n' in the 'n^{th}' second is given by

(A) $S_n = u + \frac{a}{2}(2n-1)$ (B) $S_n = u - \frac{a}{2}(2n-1)$

(C) $S_n = u + \frac{a}{2}(2n+1)$ (D) $S_n = u - \frac{a}{2}(2n+1)$

19. A bullet of mass 0.01 kg is fired with a velocity of 960 ms^{-1} from a rifle of mass 3 kg, the velocity of recoil of rifle is

(A) $-320\,ms^{-1}$ (B) $-0.32\,ms^{-1}$

(C) $-3.2\,ms^{-1}$ (D) $-32\,ms^{-1}$

20. One of the following is not a scalar quantity :

(A) Mass (B) Density

(C) Force (D) Speed

21. If a body fixed about a point rotates in clockwise direction, the moment of force is measured as

(A) Positive (B) Negative

(C) Zero (D) Equal

22. The resultant magnitude of two forces P and Q acting in same line and in same direction is

(A) P – Q (B) P + Q

(C) Q – P (D) $\frac{P}{Q}$

Space For Rough Work

23. The resultant magnitude of two forces 6 N and 8 N acting at right angles to each other is

(A) 100 N (B) 10 N

(C) 48 N (D) 14 N

24. The value of resultant magnitude of two forces acting at a point is maximum, when the angle between the two forces is

(A) 0° (B) 90°

(C) 180° (D) 45°

25. Rise of liquid in a capillary tube is due to

(A) Energy (B) Viscosity

(C) Surface tension (D) Pressure

26. The ratio of volume stress to volume strain is called

(A) Bulk modulus (B) Young's modulus

(C) Rigidity modulus (D) Poisson's ratio

27. The reciprocal of bulk modulus of elasticity is called

(A) Compressibility (B) Rigidity

(C) Plasticity (D) Modulus of elasticity

28. The force of cohesion is maximum in

(A) Solids (B) Gases

(C) Liquids (D) Plasma

Space For Rough Work

29. The value of surface tension is 80 dyne/cm. What will be its value in Nm^{-1} ?

(A) $8\times10^{2}\ Nm^{-1}$ (B) $80\ Nm^{-1}$

(C) $8\times10^{-2}\ Nm^{-1}$ (D) $8\times10^{3}\ Nm^{-1}$

30. Pressure at the bottom of a container having base area of 10 m^2 filled with water to a height of 10 m is

(A) 9.8×10^{4} Pa (B) 980×10^{4} Pa

(C) 9.8×10^{-4} Pa (D) 980×10^{-4} Pa

31. 100 °C when expressed in absolute scale is

(A) 100 K (B) 0 K

(C) 273 K (D) 373 K

32. Gas law which gives the relation between pressure and volume changes is

(A) Boyle's law (B) Charles' law

(C) Gay-Lussac's law (D) Hooke's law

33. Amount of heat required to raise the temperature of one gram of water through 1 °C is

(A) Heat capacity (B) Conductivity

(C) Calorie (D) Joule

34. An example of longitudinal wave is

(A) Sound waves (B) Waves on the surface of water

(C) Light waves (D) Electromagnetic waves

Space For Rough Work

35. The relation between velocity of sound v, and absolute temperature T is

(A) $v \propto T$ (B) $v \propto \frac{1}{T}$

(C) $v \propto \sqrt{T}$ (D) $v \propto T^2$

36. The distance between a node and the next antinode in a stationary wave is equal to

(A) one wavelength (B) half wavelength

(C) twice wavelength (D) one fourth wavelength

37. Damage caused by marching military columns to the suspension bridge is due to

(A) Echo (B) Resonance

(C) Beats (D) Interference

38. During forced vibrations, if the forced frequency is F_1 and natural frequency is F_2, the body resonates if

(A) $F_1 > F_2$ (B) $F_2 > F_1$

(C) $F_1 = 2.5\, F_2$ (D) $F_1 = F_2$

39. The fundamental frequency of transverse vibrations of the stretched string is inversely proportional to

(A) tension (B) length of string

(C) square root of tension (D) square root of length of string

40. Minimum length of a hall to produce an echo is

(A) 50 m (B) 34 m

(C) 25 m (D) 17 m

Space For Rough Work

PART – B
APPLIED MATHEMATICS

41. The maximum value of $7 - 8x - 2x^2$ is

(A) 15 (B) –4

(C) –2 (D) 31

42. The value of $\int \log 2x \, dx$ is

(A) $x \log 2x + x + C$ (B) $x \log 2x - x + C$

(C) $\frac{1}{2x} + C$ (D) $\frac{1}{x} + C$

43. The value of $\int \sec^4 x \cdot \tan x \, dx$

(A) $\frac{\sec^4 x}{4} + C$ (B) $4 \sec^4 x + C$

(C) $3 \sec^2 x + C$ (D) $\frac{\tan^4 x}{4} + C$

44. The value of $\int x \log x \, dx$ is

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

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

45. $\int_0^{\pi/4} \tan^2 x \, dx$ is equal to

(A) $\frac{\pi}{4} - 1$ (B) $1 - \frac{\pi}{4}$

(C) $\frac{\pi^2}{16}$ (D) $\frac{\pi^2}{16} - 1$

Space For Rough Work

46. The value of $\int_0^1 x\sqrt{1-x^2}\,dx$ is

(A) $-\frac{1}{3}$ (B) 0

(C) ∞ (D) $\frac{1}{3}$

47. The volume generated by revolving the line $y = x + 1$ about the x-axis between the ordinates $x = 0$ and $x = 2$

(A) $\frac{26\pi}{3}$ units (B) $\frac{10\pi}{3}$ units

(C) $\frac{26}{3}$ units (D) 4 units

48. The degree and order of the differential equation $\frac{d^2y}{dx^2} = \left[1+\left(\frac{dy}{dx}\right)^2\right]^{1/3}$ are

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

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

49. The solution of differential equation $\frac{dy}{dx} + y\tan x = \sec x$ is

(A) $y\sec x = \tan x + C$

(B) $y\sin x = \sec x + C$

(C) $\log(\sec x) = \tan x + C$

(D) $y\sec x = -\cot x + C$

Space For Rough Work

50. The value of x if $\begin{vmatrix} 1 & 2 & 3 \\ 2 & x & 3 \\ 3 & 4 & 3 \end{vmatrix} = 0$ is

(A) 0 (B) -3

(C) 3 (D) 18

51. The value of x, if $4x + y = 7$, $3y + 4z = 5$ and $3z + 5x = 2$ is

(A) 0 (B) 1

(C) 3 (D) -1

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

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

(C) $-\frac{1}{11}\begin{bmatrix} -4 & -3 \\ 1 & 2 \end{bmatrix}$ (D) $-\frac{1}{11}\begin{bmatrix} -4 & 1 \\ -3 & 2 \end{bmatrix}$

53. The characteristic equation of the matrix $A = \begin{bmatrix} 2 & -1 \\ 5 & -6 \end{bmatrix}$ is

(A) $A^2 + 8A - 7I = 0$ (B) $A^2 + 4A - 17I = 0$

(C) $A^2 + 4A + 7I = 0$ (D) $A^2 + 4A - 7I = 0$

Space For Rough Work

54. If $\begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix} + A = \begin{bmatrix} 5 & 1 \\ 3 & 2 \end{bmatrix}$, then A is

(A) $\begin{bmatrix} 3 & 2 \\ -2 & 0 \end{bmatrix}$ (B) $\begin{bmatrix} 3 & -2 \\ 2 & 0 \end{bmatrix}$

(C) $\begin{bmatrix} -2 & 3 \\ 2 & 0 \end{bmatrix}$ (D) $\begin{bmatrix} 0 & 3 \\ -2 & 2 \end{bmatrix}$

55. The middle term of the expansion of $\left(x^2 - \frac{2}{x}\right)^{24}$ is

(A) ${}^{24}C_{10}2^{10}x^{12}$ (B) ${}^{24}C_{11}2^{12}x^{12}$

(C) ${}^{24}C_{13}2^{10}x^{10}$ (D) ${}^{24}C_{12}2^{12}x^{12}$

56. The term independent of x in $\left(x^2 - \frac{4}{3x}\right)^9$ is

(A) ${}^9C_6(4)^6$ (B) ${}^9C_6(3)^{-6}$

(C) ${}^9C_6\left(\frac{4}{3}\right)^6$ (D) ${}^9C_6\left(\frac{3}{4}\right)^6$

57. If $3i - 2j + k$, $i - 3j + 5k$, $2i + j - 4k$ are the sides of a triangle, then the triangle is

(A) Right angled triangle (B) Equilateral triangle

(C) Isosceles triangle (D) Isosceles right angled triangle

58. If $\vec{a} = (2, -1, 4)$ and $\vec{b} = (2, -3, 4)$, then projection of $\vec{a}$ on $\vec{b}$ is

(A) $\frac{23}{\sqrt{21}}$ (B) $\frac{23}{\sqrt{29}}$

(C) $\frac{-23}{\sqrt{29}}$ (D) $\frac{-23}{\sqrt{21}}$

Space For Rough Work

59. The sine of the angle between the vectors $(2i - 2j + k)$ and $2i + j + 2k$ is

(A) $\frac{\sqrt{65}}{3}$ (B) $\frac{\sqrt{65}}{\sqrt{3}}$

(C) $\frac{\sqrt{65}}{9}$ (D) $\sqrt{65}$

60. If $x \sin^2 45 = \frac{\tan^2 45 + \cot^2 30}{\sin^2 45 + \cos^2 45}$ then the value of x is

(A) 4 (B) 2

(C) 6 (D) 8

61. The value of $\frac{4}{3}\sec^2 \frac{\pi}{3} - \text{cosec}^2 \frac{\pi}{6} + \frac{3}{4}\tan^2 \frac{\pi}{4} - 2\sin^2 \frac{\pi}{3}$ is

(A) $-\frac{11}{12}$ (B) $\frac{53}{12}$

(C) $\frac{7}{12}$ (D) $-\frac{7}{12}$

62. The value of

$$\frac{\sin(90-0)}{\cos(360-0)} + \frac{\sec\left(\frac{3\pi}{2}+0\right)}{\text{cosec}(\pi+0)} + \frac{\tan(180-0)}{\tan(-0)} \text{ is}$$

(A) 1 (B) -1

(C) 3 (D) 2

63. The value of cosec 43 cot 43 cot 47 cos 47

(A) 1 (B) 0

(C) -1 (D) 2

Space For Rough Work

64. The value of $\frac{\tan 69^\circ + \tan 66^\circ}{1 - \tan 69^\circ \tan 66^\circ}$

(A) 1 (B) -1

(C) 0 (D) ∞

65. If $\tan \frac{A}{2} = x$ then sin A + tan A is

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

(C) $\frac{4x}{1+x^4}$ (D) $\frac{4x}{1-x^4}$

66. The value of $\sin 70^\circ - \sin 50^\circ - \sin 10^\circ$ is

(A) 1 (B) 0

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

67. $\sin^{-1} x$ is also equal to

(A) $\text{cosec}^{-1}\left(\frac{1}{x}\right)$ (B) $\text{cosec}\, x$

(C) $\text{cosec}^{-1} x$ (D) $\frac{1}{\sin x}$

68. Centroid divides the median in the ratio

(A) 2 : 1 (B) 1 : 2

(C) 1 : 1 (D) 1 : 4

69. The co-ordinates of a point which divides the line join of the points (a + b, a – b) and (a – b, a + b) in the ratio 2 : 3 is

(A) $\frac{5a+5b}{5}, \frac{5a-5b}{5}$ (B) $\frac{a+b}{5}, \frac{a-b}{5}$

(C) $\frac{5a+b}{5}, \frac{5a-b}{5}$ (D) $\frac{5a-b}{5}, \frac{a+5b}{5}$

Space For Rough Work

70. The equation of straight line whose intercepts are 3 and 5 on the axes is

(A) $5x - 3y = 15$ (B) $5x + 3y = 15$

(C) $5x + 3y = 1$ (D) $15x + 15y = 1$

71. The angle between the lines whose slopes are $\sqrt{3}$ and $\frac{1}{\sqrt{3}}$ respectively is

(A) $\frac{\pi}{6}$ (B) $\frac{\pi}{3}$

(C) $\frac{\pi}{4}$ (D) $\frac{\pi}{2}$

72. The equation of the straight line passing through (2, 3) and x intercept is twice its y intercept is

(A) $x + 2y = 8$ (B) $x - 2y = 8$

(C) $x + y = 4$ (D) $2x + 2y = 8$

73. The equation to the line passing through the point (–6, 7) and parallel to the line joining (3, 4) and (6, –8) is

(A) $4x + y + 31 = 0$ (B) $x + 4y - 1 = 0$

(C) $x - 4y + 1 = 0$ (D) $4x + y + 17 = 0$

74. $\lim_{\theta \to \pi/2} (\sec\theta - \tan\theta)$ is equal to

(A) 0 (B) 1

(C) $\frac{\pi}{2}$ (D) π

75. $\lim_{x \to 4} \frac{x-4}{3-\sqrt{13-x}}$ is equal to

(A) 3 (B) 9

(C) 6 (D) 0

Space For Rough Work

76. If $y = (1 + \log x)^5$, then $\frac{dy}{dx}$ is

(A) $5(\log x)^4$ (B) $\frac{5}{x}(1 + \log x)^4$

(C) $5(1 + \log x)^4$ (D) $5x^4 \log x$

77. If $x = \cos^{-1} t$ and $y = \sin^{-1} t$, then $\frac{dy}{dx}$ is

(A) -1 (B) 1

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

78. If $y = x \log y$, then $\frac{dy}{dx}$ is

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

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

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

(A) $\frac{1}{(x+2)^2}$ (B) $\frac{2x+3}{(x+2)^2}$

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

80. The equation of tangent to the curve $y^2 = 4x$ at (1, 2) is

(A) $x + y - 3 = 0$ (B) $x - y + 1 = 0$

(C) $2x - y = 0$ (D) $2x + y - 4 = 0$

Space For Rough Work

PART – C

ELECTRONICS AND COMMUNICATION

81. Each node is connected to every other node by dedicated direct links in _____ topology.

(A) Mesh (B) Star

(C) Ring (D) Bus

82. Ethernet uses _____ topology.

(A) Ring (B) Mesh

(C) Bus (D) Star

83. In _____ IP address the first 16 bits identify the network and remaining 16 bits indicate host within the network.

(A) Class A (B) Class B

(C) Class D (D) Class E

84. Quantization Noise occurs in

(A) PCM (B) TDM

(C) FDM (D) PWM

85. This system does not need a Synchronous (coherent) carrier at the demodulator.

(A) BPSK (B) FSK

(C) DPSK (D) ASK

86. The most commonly used method for firing SCR is _____

(A) Radiation Triggering (B) Thermal Triggering

(C) Gate Triggering (D) Voltage Triggering

87. The process of switching off of a Thyristor is known as _____

(A) Commutation (B) Triggering

(C) Rectification (D) Saturation

Space For Rough Work

88. The device which converts dc power into ac power at the desired voltage and frequency is called _____

(A) Rectifier (B) Chopper

(C) Inverter (D) Cyclo-converter

89. In chopper circuit, the thyristor is switched off at regular intervals by adopting _____

(A) Natural commutation

(B) Forced commutation

(C) Both natural and forced commutation

(D) None of these

90. A center taped transformer configuration of single phase cyclo-converter uses _____

(A) 4 SCRs (B) 6 SCRs

(C) 2 SCRs (D) 8 SCRs

91. The heart of an Inverter is _____

(A) Rectifier circuit (B) Step up Transformer

(C) Oscillator circuit (D) Filter circuit

92. Relay logic control works on the principle of _____

(A) Magnetic field (B) Logic gates

(C) Electrostatic field (D) Ladder logic

93. Electrical signal from PLC is converted into physical condition by _____.

(A) Sensors (B) Scanners

(C) Controllers (D) Actuators

94. Which logic gate is formed by connecting 2 normally closed contacts in series ?

(A) NOR (B) OR

(C) NAND (D) AND

Space For Rough Work

95. The 8086 microprocessor has _____ bit wide address bus.

(A) 15 (B) 8

(C) 16 (D) 20

96. Which of the following is not a valid 8086 flag bit ?

(A) Over flow flag (B) String direction flag

(C) Single step trap flag (D) Machine control flag

97. Which of the following is not an arithmetic instruction ?

(A) INC (Increment) (B) CMP (Compare)

(C) DEC (Decrement) (D) ADD (Addition)

98. Functions of 8255 are selected or achieved by programming the bits of an internal register called

(A) CONTROL REGISTER

(B) CONTROL WORD REGISTER

(C) FUNCTION CONTROL REGISTER

(D) None of these

99. 8253 has _____ no of channels or counter register.

(A) 1 (B) 3

(C) 2 (D) 4

100. Which of the following is an 8251 operating mode ?

(A) Programmable one shot (B) Rate generator

(C) Square wave generator (D) None of these

101. The typical value of resting potential of a cell will be

(A) –60 mV (B) –100 mV

(C) –60 mV to –100 mV (D) +20 mV

Space For Rough Work

102. The phase of cell excitation where the membrane potential changes from +20 mV to –90 mV is called

(A) depolarisation (B) polarisation

(C) potential (D) repolarisation

103. The cell is surrounded by _____ membrane which allows selective passage of materials in and out of cell.

(A) Semipermeable (B) Cell wall

(C) Nuclear membrane (D) Silicon membrane

104. The _____ interval represents repolarisation of both ventricles.

(A) T wave (B) P wave

(C) Q wave (D) R wave

105. _____ are used to treat arrhythmias.

(A) Oxygenator (B) Pacemaker

(C) Fibrillator (D) Diathermy

106. In photoelectric colorimetry, the eye is replaced by a _____.

(A) photoelectric cell (B) cell

(C) blood cell (D) All of these

107. The measurement of biological parameters over a distance is called as _____.

(A) PCM (B) Telemedicine

(C) Biotelemetry (D) Communication

108. Ultrasonography uses the principle of _____ of ultrasound signals from the various tissue interfaces within the body.

(A) reflection (B) absorption

(C) production (D) relaxation

Space For Rough Work

109. In an open circuit, current flowing through the load is

(A) Maximum (B) Infinity

(C) Zero (D) Minimum

110. Two resistors 6 Ω & 4 Ω are connected in parallel. The effective resistance is

(A) 24 Ω (B) 2.4 Ω

(C) 10 Ω (D) 2.0 Ω

111. Ohm's Law does not holds good when the temperature

(A) Constant (B) Minimum

(C) Varies (D) Maximum

112. The unit of capacitive reactance is

(A) Henry (B) Farad

(C) Ohm (D) mho

113. For a Sinewave Form factor is

(A) 1.11 (B) 0.707

(C) 1.414 (D) 0.637

114. The colour code for tolerance of a high stability resistor is

(A) silver (B) brown

(C) gold (D) pink

115. A RLC series circuit has a leading power factor when

(A) XL > XC (B) XL = XC

(C) Z > XL (D) XC > XL

Space For Rough Work

116. The valence electrons in a semi-conducting material is

(A) 8 (B) 2

(C) 4 (D) 6

117. The capacitance appearing across a reverse biased semi-conductor junction

(A) increases with the increase in the bias voltage

(B) decreases with the increase in the bias voltage

(C) is independent of bias voltage

(D) None of these

118. Which of the transistor configuration is capable of providing both voltage and current gains ?

(A) CB (B) CE

(C) CC (D) Both CB & CE

119. FET's are

(A) Voltage controlled devices with high input impedance

(B) Current controlled device with high input impedance

(C) Voltage controlled device with low input impedance

(D) Current controlled device with low input impedance

120. Pick the odd one out.

(A) Tunnel diode (B) DIAC

(C) SCR (D) TRIAC

121. Tunnel diode characteristics differ from ordinary function diode characteristics in the respect that

(A) are linear (B) non-linear

(C) exhibit negative resistance region (D) None of these

Space For Rough Work

122. The o/p of the Laser is monochromatic, this means that it is

(A) polarised (B) single frequency

(C) narrow beam (D) None of these

123. Decimal equivalent of a binary number $(11011)_2$ is _____.

(A) 10 (B) 3

(C) 27 (D) 11

124. _____ gate is a universal gate.

(A) AND (B) Exclusive OR

(C) OR (D) NOR

125. In a full adder circuit if the inputs are A = 0, B = 1, C_i = 1, then the outputs are _____

(A) Sum = 1, Carry = 1 (B) Sum = 0, Carry = 1

(C) Sum = 0, Carry = 0 (D) Sum = 1, Carry = 0

126. _____ are also called as Data distributors.

(A) De-Multiplexers (B) Multiplexers

(C) Comparators (D) Encoders

127. The maximum modulus number of a 4-bit counter is _____.

(A) 8 (B) 4

(C) 1 (D) 16

128. _____ is the fastest of all logic families.

(A) ECL (B) TTL

(C) CMOS (D) RTL

Space For Rough Work

129. The measure of the difference between the Actual output voltage and theoretical output voltage in a DAC is called _____.

(A) Settling time (B) Accuracy

(C) Linearity (D) Resolution

130. _____ is based on the principle of comparing Analog input voltage with set of reference voltages.

(A) Flash type ADC (B) Successive approximation ADC

(C) Dual slope ADC (D) R-2R ladder type ADC

131. Example for a volatile memory

(A) ROM (B) RAM

(C) EPROM (D) Flash memory

132. The location of unit of data in a memory array is called

(A) its storage (B) Address

(C) RAM (D) Data

133. EEPROM stands for

(A) Encapsulated Electrical Programmable Read Only Memory

(B) Elementary Electrical Programmable Read Only Memory

(C) Electrically Erasable Programmable Read Only Memory

(D) Elementary Erasable Programmable Read Only Memory

134. Memory, Processor, I/O Devices and Information are controlled by

(A) Assembler (B) Compiler

(C) Application Software (D) Operating System

135. MOV A, # 24 H is a _____ addressing.

(A) Memory direct (B) Register direct

(C) Immediate (D) Indirect

Space For Rough Work

136. Find value of variable 'b' after execution of the following 'C' prog. code.

```
int a, b;
b = 0;
for (a = 0; a < 10; a ++)
{
    break;
    b++;
}
```

(A) 0 (B) 9

(C) 10 (D) 11

137. If a = 9, b = 12 and c = 3 the value of x in the following expression is

x = a – b/3 + c * 2 – 1

(A) x = 3 (B) x = 10

(C) x = 8 (D) x = 13

138. Which of the following is not a reserved key word ?

(A) auto (B) count

(C) case (D) default

139. Find value of the following expression if a = 5, b = 10 c = –6

a > b && a < c

(A) Error (B) Undefined

(C) FALSE (D) TRUE

140. Continue statement is not used with

(A) for (B) do

(C) switch (D) while

Space For Rough Work

141. What is the value of variable 'J' after executing the following C prog. Code ?

```
i = 20;
switch(i)
{
    Case 20 : J = 'c';
    Case 10 : J = 'b';
    Case 5 : J = 'a';
}
```

(A) 'b' (B) 'c'

(C) 'a' (D) none

142. Which of the following is correct ?

(A) The expression num[2] refers to 2nd element of array.

(B) It is necessary to initialise an array when declaring it.

(C) The declaration num[size] is allowed if size is a variable

(D) The array int num[5] can store 5 elements.

143. What is the value of x[1][0] in the array declared by the following :

int x[2][2] = {1, 2, 3, 4}

(A) 4 (B) 1

(C) 2 (D) 3

144. Ripple frequency of FWR is

(A) f_{in} (B) $2\ f_{in}$

(C) $3\ f_{in}$ (D) $0.5\ f_{in}$

145. In a transistor with increase in the collector base reverse voltage

(A) the base width increases (B) the base width decreases

(C) the base width is not affected (D) the base width can increase or decrease

Space For Rough Work

146. Class C amplifiers are generally used as

(A) Low frequency amplifier (B) R. F. amplifier

(C) Audio amplifier (D) None of these

147. The output voltage of a CE amplifier is

(A) Amplified (B) Inverted

(C) 180° out of phase with the input (D) All of these

148. Stability factor of common base circuit in a transistor is

(A) 10 (B) 1

(C) 100 (D) 1000

149. For oscillators to start in a circuit the loop gain must be greater than 1 when the phase shift around the loop is

(A) 90° (B) 180°

(C) 270° (D) 360°

150. The pulse width in a 555 monostable multivibrator is given by

(A) $t = 0.69\ RC$ (B) $T = 1.1\ RC$

(C) $t = RC$ (D) None of these

151. The slew rate specification of an op-amp is usually measured in

(A) Micro volts/sec (B) Volts/micro sec

(C) Decibels (D) Volts/Micro volts

152. According to Maximum Power Transfer theorem power delivered to load is

(A) $Ith \times Rth$ (B) $\frac{Vth^2}{4 \times Rth}$

(C) $Vth \times Rth$ (D) $Rth \times Ith \times Vth$

Space For Rough Work

153. In series resonance the instantaneous voltage across a pure inductor _____ the current by 90°.

(A) Inphase (B) Leads

(C) Lags (D) None of these

154. The circuit impedance at resonance is called as

(A) dynamic impedance (B) pure impedance

(C) impedance (D) resistance

155. Amplitude modulation will have

(A) side bands and carrier (B) LSB and USB

(C) carrier only (D) vestigial band

156. The purpose of pre-emphasis and De-emphasis in FM is

(A) improve SNR (B) noise

(C) power (D) current

157. Frequency modulation has

(A) one carrier

(B) one carrier with 2 side band frequencies

(C) one carrier with infinite frequencies

(D) infinite frequencies

158. In pulse width modulation the carrier is

(A) Sine wave (B) Pulse

(C) Triangular (D) Cosine

159. The closeness of values indicated by an instrument to the actual value is

(A) repeatability (B) reliability

(C) uncertaining (D) accuracy

Space For Rough Work

160. The difference between the expected value of the variable and the measured variable is termed

(A) absolute error (B) random error

(C) instrument error (D) gross error

161. An AC bridge uses a detector in the form of

(A) Ammeter (B) Voltmeter

(C) Head phones (D) Wattmeter

162. The sensitivity of voltmeter is defined as

(A) Ω/V (B) V/Ω

(C) I/Ω (D) Ω/I

163. An electronic switch is used in a

(A) single beam CRO (B) dual beam CRO

(C) dual trace CRO (D) sampling CRO

164. A sweep generator is used for

(A) Fault finding (B) Frequency generation

(C) Amplification (D) Alignment

165. Electro-dynamometer type instruments can measure

(A) AC (B) DC

(C) AC and DC (D) None of these

166. The operation of a thermocouple is based on

(A) Seebeck effect (B) Peltier effect

(C) Thomson effect (D) Faraday's laws

Space For Rough Work

167. Thermistor is used for _____ measurement.

(A) weight (B) pressure

(C) temperature (D) power

168. To provide high input impedance, electronic voltmeters normally use _____ .

(A) Diodes (B) BJT

(C) FET (D) SCR

169. Which pin on 8051 enables it to fetch program code from external program memory ?

(A) $\overline{EA}$/VPP (B) RST

(C) ALE (D) PSEN

170. Memory address of register R_0 of register bank 2 in 8051 is

(A) 10 H (B) 11 H

(C) 08 H (D) 09 H

171. In 8051 microcontroller, when a byte is pushed on to stack the pointer is

(A) Incremented (B) Decremented

(C) Reset to zero (D) Does not change

172. The address of a 1k byte memory ranges from

(A) 0000 H to 03FF H (B) 0000 H to 01FF H

(C) 0000 H to 02FF H (D) 0000 H to 04FF H

173. The vector address of INT1 in 8051 is

(A) 0003 H (B) 000B H

(C) 0013 H (D) 001B H

Space For Rough Work

174. Programming the timer in 8051 to mode 1 causes

(A) 13 bit timer mode (B) 16 bit timer mode

(C) 8 bit auto load mode (D) 4 bit auto load mode

175. In 8051 the data byte to be transmitted serially is written to register

(A) SCON (B) SBUF

(C) TMOD (D) SMOD

176. The network usually owned by a licensed or Government agencies are _____.

(A) LAN (B) WAN

(C) MAN (D) Ethernet

177. _____ is also called as store & forward system.

(A) Circuit switching (B) Data switching

(C) Information switching (D) Message switching

178. The connectionless protocol are preferred for _____ type of transmission.

(A) Text (B) Voice

(C) Video (D) Both Voice & Video

179. _____ layer is responsible for hop to hop delivery of packets between 2 systems on the same link.

(A) Application (B) Data link

(C) Network (D) Transport

180. _____ connects two networks that use different protocol families.

(A) Bridges (B) Switches

(C) Routers (D) Gateways

Space For Rough Work

D-1