

Booklet Code No. **16127**

Roll Number :

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INSTRUCTIONS TO CANDIDATES

[Do not open booklet unless you are asked to do so]

1. Fill in the OMR sheet carefully as per the instructions given on the back of the OMR sheet.
2. Use only black/blue ink ball point pen to fill in the OMR sheet.
3. Write your Roll Number (six digits) on the Question Booklet and on the left hand side of the OMR sheet (basic data part).
4. There are 120 Objective type multiple choice questions, which are to be answered in 120 minutes.
5. There are 4 options (A, B, C & D) for each question. Mark your answer corresponding to each question number by darkening the corresponding bubble in the OMR sheet with a black/blue ink ball point pen. **For every correct answer 1 mark will be awarded and for every incorrect answer 1/4th mark will be deducted from the total marks scored. No deduction of mark will be made for unanswered questions.** Marking of more than one bubble against a question number in the OMR sheet will be considered as an incorrect answer. Erasing, overwriting, partial marking etc. may also be treated as incorrect answer.
6. Candidates will not be allowed to use Calculator, Logarithm table, Mobile phone or any other electronic equipment in the examination hall.
7. The OMR sheet should be returned to the invigilator. The Admit Card and Question Booklet can be retained by the candidate after the examination. Answer keys will be published in the website www.tekerala.org after the examination. Complaints, if any, from the candidates regarding the answer keys with valid proof may be sent to the Joint Controller, Office of the Controller of Technical Examinations, Kaimanam, Thiruvananthapuram-40 so that it may reach this office within five calendar days from the date of publication of answer keys. Complaints not substantiated with supporting documents will not be considered. However, the decision of the experts regarding such complaints on the answer keys shall be final.
8. Candidates will be allowed to leave the examination hall only after the completion of the examination time.



Read the passage given and answer questions 1-5 :

We all know that birds build nests. Some find trees the most convenient. Others prefer hedges, the caves of roofs, chimney pots, rocky ledges or holes in trees. But what does a bird do that can neither fly nor swim ? Living on the dry, open plains of Eastern and Southern Africa, the Ostrich takes no pains to hide its nest. It merely finds a suitable shallow depression in the ground, which it may scoop out further with its feet. The hole may be upto three yards across. In it are laid six to eight eggs, each one by a different female. Then one hen and one cock take turns guarding the two and a half pound eggs until they are ready to hatch. The Ostrich does not sit on its eggs to incubate them. Rather, it squats between them, spreading its wings to provide shade and keep them from cooking in the hot desert sun.

1. The Ostrich makes its nest
 - (A) On top of chimneys
 - (B) By locating a hole in the ground
 - (C) On rocks
 - (D) Near water bodies.
2. 'Then one hen and one cock take turns' means :
 - (A) After laying eggs the hen and cock roam around
 - (B) The hen and the cock rotate around the eggs
 - (C) The hen and the cock safeguard the eggs one after the other
 - (D) The hen and the cock leave the eggs behind and return after they hatch
3. The word opposite in meaning to 'convenient' is

(A) Disconvenient	(C) Inconvenient
(B) Unconvenient	(D) Misconvenient
4. Here, 'Shallow depression' means

(A) Atmospheric pressure	(C) Sadness
(B) A hole that is not deep	(D) Unlike others
5. 'Scoop out' means

(A) Dig	(C) Plunge into
(B) Shout	(D) Focus on

Choose the appropriate words : (6-7)

6. he a good singer ?

(A) Is	(C) Will
(B) Can	(D) Shall
7. Many a was asked by the journalists.

(A) queries	(C) questions
(B) question	(D) enquiry

Identify the wrong part (8-9)

8. The informations/on the death toll/was updated/every hour
 (A) the informations (C) was updated
 (B) on the death toll (D) every hour
9. The tourist guide described about/the historical relevance and the architectural complexity of/the Kutb Minar in detail/with clarity
 (A) the tourist guide described about
 (B) the historical relevance and architectural complexity of
 (C) the Kutb Minar in detail
 (D) with clarity
10. Complete the proverb suitably :
 Born with a silver spoon
- (A) in his/her hand (C) in his/her pocket
 (B) in his/her plate (D) in his/her mouth
11. Consider the system of equations $x - y + 3z = 4$, $x + z = 2$, $x + y - z = 0$. This system has
 (A) a unique solution (C) infinitely many solutions
 (B) finitely many solutions (D) no solution
12. Let P and Q be square matrices such that $PQ = I$, then zero is an eigen value of
 (A) P but not of Q (C) both P and Q
 (B) Q but not of P (D) neither P nor Q
13. The eigen values of a square matrix A are 2 and 3. Then A^3 is equal to
 (A) $19A - 30I$ (C) $25(A - I)$
 (B) $30A - 19I$ (D) $30(A - I)$
14. The canonical form of the quadratic form $4x^2 + 4y^2 + 2xy$ is
 (A) $3x_1^2 + 5x_2^2$ (C) $5x_1^2 - 3x_2^2$
 (B) $3x_1^2 - 5x_2^2$ (D) $x_1^2 + 5x_2^2$
15. The eigen values of the matrix A^{-1} if $A^2 = \begin{bmatrix} 19 & 6 \\ 18 & 7 \end{bmatrix}$ are
 (A) 1, 5 (C) $1, -\frac{1}{3}$
 (B) -1, 3 (D) $1, \frac{1}{5}$
16. The n^{th} derivative of $\log(5x + 3)$ is
 (A) $\frac{(-1)^{n-1} (n-1)! 5^n}{(5x + 3)^n}$ (C) $\frac{(-1)^{n-1} \cdot (n-1)! 5^n}{(5x + 3)^{(n+1)}}$
 (B) $\frac{(-1)^n (n-1)! 5^n}{(5x + 3)^n}$ (D) $\frac{(-1)^n n! 5^n}{(5x + 3)^{(n+1)}}$

17. The value of $\lim_{x \rightarrow 0} \left(\frac{1}{x^2} - \frac{1}{\sin x} \right)$
- (A) 0 (C) 2
(B) 1 (D) α
18. The equation of the evolute of the circle $x^2 + y^2 = 4$ is
- (A) $x^2 + y^2 = 4$ (C) $x + y = 2$
(B) $(0, 0)$ (D) $y = x$
19. Given that $u = \log \left(\frac{x^2 + y^2}{x + y} \right)$. Then $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$ is equal to
- (A) e^u (C) 1
(B) u (D) 0
20. For the function $f(x, y) = 1 - x^2 - y^2$, $(0, 0)$ is a
- (A) maximum point (C) saddle point
(B) minimum point (D) neither maximum nor minimum
21. The infinite series $\frac{1}{1.2.3} + \frac{3}{2.3.4} + \frac{5}{3.4.5} + \dots$
- (A) converges (C) conditionally convergent
(B) diverges (D) oscillates
22. The infinite series $\frac{x}{3.4} + \frac{x^2}{5.6} + \frac{x^3}{7.8} + \dots$
- (A) converges for $x < 1$, diverges for $x \geq 1$
(B) converges for $x > 1$, diverges for $x \leq 1$
(C) converges for $x \leq 1$, diverges for $x > 1$
(D) diverges for all values of x
23. Which one of the following statement is true
- (A) every convergent series converges absolutely
(B) every absolutely convergent series converges
(C) every alternating series converges absolutely
(D) every alternating series converges to zero
24. The infinite series $\sum_{n=1}^{\infty} \left(\frac{n}{n+1} \right)^{n^2}$
- (A) converges (C) conditionally convergent
(B) diverges (D) oscillates
25. The infinite series $\frac{1}{1.2} - \frac{1}{3.4} + \frac{1}{5.6} - \frac{1}{7.8} + \dots$
- (A) converges (C) conditionally convergent
(B) diverges (D) oscillates

26. Let $f(x)$ be function which satisfies Dirichlet's condition in its domain and let $f(x)$ has finite discontinuity at $x = a$. Then at $x = a$ the corresponding Fourier series converges to

- (A) $f(a)$ (C) $f(a-)$
 (B) $f(a+)$ (D) $\frac{1}{2}[f(a+) + f(a-)]$

27. Which of the following functions has only sine terms in its Fourier series expansion ?

- (A) $f(x) = \begin{cases} 1+x; & -2 < x < 0 \\ 1-x; & 0 < x < 2 \end{cases}$ and $f(x+4) = f(x)$
 (B) $f(x) = x \sin x$ in $-\pi < x < \pi$ and $f(x+2\pi) = f(x)$
 (C) $f(x) = x \cos x$ in $-\pi < x < \pi$ and $f(x+2\pi) = f(x)$
 (D) both (a) and (b)

28. Fourier series representation of $f(x) = |x|$ in $-\pi < x < \pi$ and $f(x+2\pi) = f(x)$ is

- (A) $f(x) = \frac{\pi}{2} - \frac{4}{\pi} \sum_{n=1}^{\infty} \frac{\cos(2n-1)x}{(2n-1)^2}$
 (B) $f(x) = \frac{\pi}{2} + \frac{4}{\pi} \sum_{n=1}^{\infty} \frac{\cos(2n-1)x}{(2n-1)^2}$
 (C) $f(x) = \frac{\pi}{2} - \frac{4}{\pi} \sum_{n=1}^{\infty} \frac{\sin(2n-1)x}{(2n-1)^2}$
 (D) $f(x) = \frac{\pi}{2} - \frac{4}{\pi} \sum_{n=1}^{\infty} \frac{\cos(2n+1)x}{(2n+1)^2}$

29. Laplace transform of $e^{-2t} t^2$ is

- (A) $\frac{2!}{(s+2)^3}$
 (B) $\frac{3!}{(s+2)^3}$
 (C) $\frac{2!}{(s-2)^3}$
 (D) $\frac{1}{(s+2)^3}$

30. Inverse Laplace transform of $\frac{s+1}{s^2+2s+5}$ is

- (A) $e^t \cos 2t$
 (B) $e^{-t} \cos 2t$
 (C) $e^{-t} \sin 2t$
 (D) $e^t \sin 2t$

31. Which of the following represents the grade of cement
- (A) 28 day compressive strength of cement concrete cubes 50 cm² area
 - (B) 28 day compressive strength of cement mortar cubes 50 cm² area
 - (C) 7 day compressive strength of cement concrete cubes 15 x 15 cm size
 - (D) 7 day compressive strength of cement mortar cubes 15 x 15 cm size
32. Fineness modulus of fine aggregate is
- (A) Less than 2
 - (B) 2 to 3.5
 - (C) 4.5 to 6.0
 - (D) Greater than 6
33. Which one of the following graded aggregate is most suitable for concrete
- (A) Uniformly graded
 - (B) Gap graded
 - (C) Well graded
 - (D) Poorly graded
34. Age of the tree represents
- (A) Cambium layer
 - (B) Medullary rays
 - (C) Bark
 - (D) Annual rings
35. The type of bond in a brick masonry containing headers and stretchers laid alternately in the same course is called
- (A) English bond
 - (B) Flemish bond
 - (C) Header bond
 - (D) Stretcher bond
36. Which one of the following type of foundation is suitable for filled up land
- (A) Isolated footing
 - (B) Combined footing
 - (C) Wall footing
 - (D) Raft foundation
37. Half brick cut longitudinally is known as
- (A) King closer
 - (B) Queen closer
 - (C) Bevelled closer
 - (D) Mitred closer
38. Stones laid on the external corner of a wall is known as
- (A) Through stones
 - (B) Jambs
 - (C) Quoins
 - (D) Corbel
39. Horizontal projection of head and sill of a door or window frame is known as
- (A) Style
 - (B) Rail
 - (C) Horn
 - (D) Mullion
40. Which of the following grade is used in prestressed concrete
- (A) M₁₅
 - (B) M₂₀
 - (C) M₂₅
 - (D) M₄₀

41. A roof which slopes in four directions are known as
- (A) Gable roof (C) Gambrel roof
(B) Hip roof (D) Lean to roof
42. The length of a line is found to be 8.0 m when measured with a 20 m chain. If the chain is 12 cm too short find the correct length of the line
- (A) 7.592 m (C) 7.259 m
(B) 7.952 m (D) 7.925 m
43. Which of the following statement is incorrect
- (A) Base line is the largest of the survey lines
(B) Survey stations should be intervisible
(C) Line ranger is used when survey stations are intervisible
(D) Reciprocal ranging is used when survey stations are intervisible
44. Following are the offsets from a chain line to a curved boundary at 20 m intervals. Find the enclosed area by Simpson's rule. Offsets are 0, 9.6, 12.50, 16.80, 0.
- (A) 870.68 m² (C) 870.67 m²
(B) 870.76 m² (D) 870.86 m²
45. Any surface parallel to the mean spheroidal surface of the earth is known as
- (A) Contour surface (C) Level surface
(B) Contour line (D) Level line
46. Entropy change due to a small change of properties along a quasi-static process is
- (A) $\frac{dQ}{T}$ (C) PdV
(B) $\frac{dW}{T}$ (D) Tdp
47. Work done in a constant volume process is
- (A) Vdp (C) 0
(B) $P_1V_1 - P_2V_2$ (D) $\frac{P_1V_1 - P_2V_2}{n - 1}$
48. A polytropic process is represented by the equation $PV^n = \text{constant}$. The value of 'n' for constant volume process is given by
- (A) 0 (C) C_p/C_v
(B) 1 (D) α
49. The temperature ratio in an adiabatic process is
- (A) $\left(\frac{P_2}{P_1}\right)^\gamma$ (C) $\left(\frac{P_2}{P_1}\right)$
(B) $\left(\frac{P_2}{P_1}\right)^{\frac{\gamma-1}{\gamma}}$ (D) $\left(\frac{P_1}{P_2}\right)$

50. The number of power strokes per second of a four stroke diesel engine running at 'N' rpm is
- (A) $\frac{N}{120}$ (C) $\frac{N}{30}$
 (B) $\frac{N}{60}$ (D) $\frac{N}{3600}$
51. The water height equivalent of one atmospheric pressure is
- (A) 100 m (C) 1 m
 (B) 10 m (D) 10 cm
52. Centrifugal pump is
- (A) a rotodynamic pump (C) always radial flow type
 (B) a positive displacement pump (D) axial flow type
53. One ton of refrigeration is equal to
- (A) 3.52 kw (C) 35.2 kw
 (B) 0.352 kw (D) 23.5 kw
54. Psychrometry refers to
- (A) Properties of all type of refrigerants
 (B) Properties of liquid refrigerants
 (C) Properties of moist air
 (D) Properties of gaseous refrigerant
55. Boiler mountings are
- (A) Essential for generation of steam
 (B) Devices to improve the efficiency of steam generation
 (C) Devices to accelerate steam generation
 (D) Safety devices
56. The gear used for transmitting power between non-intersecting shafts at right angles to each other
- (A) Worm gears (C) Spur gears
 (B) Bevel gears (D) Helical gears
57. The ratio of tension between the tight and slack sides of a belt with angle of contact ' θ ' and coefficient of friction ' m ' is
- (A) $e^{-m\theta}$ (C) $e^{m\theta}$
 (B) $e^{-2m\theta}$ (D) $e^{2m\theta}$
58. Module of a gear is
- (A) Inversely proportional to the number of teeth
 (B) Inversely proportional to diameter
 (C) Directly proportional to the number of teeth
 (D) Depends on the top land

59. Upsetting is connected with
- (A) Hand forging (C) Milling
(B) Turning (D) Shaping
60. Conventional method of gear making is
- (A) Reaming (C) Lapping
(B) Broaching (D) Milling
61. Which of the following bulbs will have the least resistance ?
- (A) 220 V, 60 W (C) 115 V, 60 W
(B) 220 V, 100 W (D) 115 V, 100 W
62. If Q be the charge and C be the capacity of a condenser, then energy stored in the capacitor is given by
- (A) $\frac{1}{2} QC$ (C) $\frac{1}{2} Q^2C$
(B) $\frac{1}{2} QC^2$ (D) $\frac{1}{2} \frac{Q^2}{C}$
63. Relative permittivity of vacuum is
- (A) Zero (C) 8.854×10^{-12}
(B) Unity (D) 8.854
64. The power factor of a purely inductive circuit is
- (A) Zero (C) 0.5 leading
(B) 0.5 lagging (D) Unity
65. For the same peak value of voltage, which wave will have the highest rms value ?
- (A) Sine wave (C) Triangular wave
(B) Half-wave rectified sine wave (D) Square wave
66. Transformer cores are laminated to reduce
- (A) Eddy current loss (C) Both eddy current and Hysteresis loss
(B) Hysteresis loss (D) Ohmic loss
67. What happens if the field winding of a running DC shunt motor suddenly breaks open ?
- (A) Its speed slows down
(B) It gives out sparks
(C) Its speed become dangerously high
(D) It stop atonce
68. As per the recommendation of IS the maximum load that can be connected to in one light/fan sub-circuit is
- (A) 1000 w (C) 3000 w
(B) 800 w (D) 500 w

69. HRC fuse provide best protection against
- (A) Open circuit (C) Short circuit
(B) Over load (D) Reverse current
70. What is the use of white matter coated inside the fluorescent lamp ?
- (A) It reduces the brightness
(B) It provides proper exterior to the tube
(C) It converts the ultra violet radiation into visible light
(D) It provides ions necessary for the gas discharge
71. For lead acid battery, seperators are provided to
- (A) Reduce internal resistance
(B) Facilitate flow of current
(C) Avoid internal short circuits
(D) Increase the energy efficiency
72. A Kaplan turbine is
- (A) Inward flow, impulse turbine
(B) Outward flow, reaction turbine
(C) High head mixed turbine
(D) Low head axial flow turbine
73. Load factor is the ratio of
- (A) $\frac{\text{Average load}}{\text{Installed capacity}}$
(B) $\frac{\text{Average load}}{\text{Maximum Demand}}$
(C) $\frac{\text{Maximum Demand}}{\text{Average load}}$
(D) $\frac{\text{Maximum load}}{\text{Installed capacity}}$
74. In transmission system a feeder feeds power to
- (A) Service mains (C) Distributors
(B) Generating stations (D) All of the above
75. An isolator operates under
- (A) No load condition
(B) Full load condition
(C) 50% of load condition
(D) Fault condition

76. An n-type semiconductor at room temperature
- (A) has negative charge (C) Large electron concentration
(B) zero conductivity (D) Large hole concentration
77. A p-n junction under reverse bias condition
- (A) has very low resistance
(B) acts as a closed switch
(C) has no depletion layer
(D) acts as an open switch
78. A bridge rectifier
- (A) is suitable for rectifying very low voltage
(B) requires a centre tapped transformer
(C) requires only two diodes
(D) requires diodes with lower PN compared to that of centre tapped rectifier
79. The crystal structure of silicon is
- (A) face centered cubic
(B) body centered cubic
(C) zinc blende
(D) diamond lattice
80. The input to a transformer with turns ratio, $\frac{N_p}{N_s} = 10$ is 230 V rms. The peak output voltage will be :
- (A) 2300 V (C) 3250 V
(B) 23 V (D) 32.5 V
81. For an n-pn transistor in common emitter configuration, $V_{BE} = 0.7V$, $V_{CE} = 0.2V$. The transistor is operating in
- (A) Forward active region
(B) Inverse active region
(C) Cut-off region
(D) Forward saturation region
82. The pinch-off voltage of a JFET
- (A) increases with decrease in channel doping
(B) increases with decrease in channel thickness
(C) is independent of channel doping and thickness
(D) increases with increase in channel doping

83. The incorrect statement about a photodiode is :
- (A) The forward current of a photodiode increases as light absorption increases
 - (B) The reverse current of a photodiode increases with increase in light absorption.
 - (C) Photodiode can be used as a photo detector
 - (D) The voltage developed across a photodiode is inversely proportional to the dark current of the diode.
84. Which among the following statement is correct
- (A) A transistor in common emitter configuration has a lower input resistance than that in common base configuration
 - (B) Common emitter configuration has a higher output resistance than that in common base configuration
 - (C) The maximum frequency of operation of a transistor in common base configuration is higher than that in common emitter configuration
 - (D) The current gain in common base configuration is much greater than the current gain in common emitter configuration.
85. A common collector voltage amplifier
- (A) is a wide band amplifier
 - (B) is a high gain amplifier
 - (C) is a unity gain amplifier
 - (D) is an amplifier with high CMRR.
86. The following truth table represents a
- | AB | Y |
|----|---|
| 00 | 1 |
| 01 | 0 |
| 10 | 0 |
| 11 | 1 |
- (A) NAND gate
 - (B) OR gate
 - (C) EX-OR gate
 - (D) EX-NOR gate
87. A minterm in a Boolean function represents
- (A) a sum term with minimum number of variables
 - (B) a sum term with maximum number of variables
 - (C) a product term with all variables of the boolean function
 - (D) a product term with minimum number of variables
88. The input of a T flipflop is $T = 1$ with a clock frequency of 1 kHz. The output (Q) of the flipflop is
- (A) a square wave of frequency 1 kHz
 - (B) a square wave of frequency 2 kHz
 - (C) a square wave of frequency 500 Hz
 - (D) a d.c. voltage

89. Identify the correct statement regarding Frequency Modulation (FM) and Amplitude Modulation (AM)
- (A) The bandwidth required is low for FM than that in AM
 - (B) The range of signal transmission is low for FM than that in AM
 - (C) The signal quality is poor in FM receiver than in AM receiver
 - (D) FM transmitting stations are located far apart compared to AM stations
90. In a CRO the same sinusoidal signal is applied to the horizontal and vertical deflection plates. The output will be
- (A) a circle
 - (B) two circles along the horizontal axis
 - (C) a straight line with slope zero
 - (D) a straight line with slope 45°
91. Shared libraries are implemented through
- (A) static linking
 - (B) static loading
 - (C) dynamic linking
 - (D) dynamic loading
92. 'Locality of reference' is the principle behind the use of
- (A) CPU registers
 - (B) cache memory
 - (C) main memory
 - (D) secondary memory
93. Which of the following is not a variant of UNIX ?
- (A) AIX
 - (B) HP-UX
 - (C) Mac OS
 - (D) Solaris
94. Vi and emacs are
- (A) assemblers
 - (B) compilers
 - (C) debuggers
 - (D) editors
95. The value of a static variable in a C function
- (A) can be changed only by a static function
 - (B) is always 0
 - (C) is retained across multiple invocations of the function
 - (D) remains unchanged during execution of the program
96. In the statement `int* i = 4000 ;` 4000 is interpreted as
- (A) an address
 - (B) an index
 - (C) an integer
 - (D) a string
97. `# define` is an example of a
- (A) comment statement
 - (B) preprocessor directive
 - (C) variable declaration
 - (D) variable initialization

98. is the process of removing inconsistencies from an RDBMS design
- (A) journaling (C) migration
(B) locking (D) normalization
99. The output of the SQL statement `select * from employee ;` is
- (A) any one row of the employee table
(B) all rows of the employee table
(C) first row of the employee table
(D) No rows are selected
100. If table A has m rows and table B has n rows, then the cartesian product of A and B has elements
- (A) $m + n$ (C) mn
(B) $\frac{mn}{2}$ (D) m^n
101. The typical capacity of a CD ROM is
- (A) 144 MB (C) 2 GB
(B) 650 MB (D) 4.7 GB
102. Which among the following is not a video format ?
- (A) avi (C) mpeg
(B) jpeg (D) ogg theora
103. is a web server
- (A) Apache tomcat (C) Internet explorer
(B) Google chrome (D) Squid
104. Ethernet cabling typically uses connectors
- (A) RJ-11 (C) RS-232C
(B) RJ-45 (D) SATA
105. CISCO 2950 is a
- (A) bridge (C) router
(B) hub (D) switch
106. The force acting on a point on the surface of a rigid body may be considered to act
- (A) at the gravity of a body
(B) on the periphery of the body
(C) on any point on the action of the force
(D) at any point on the surface normal to the line of action of the force

107. Lami's theorem states that

- (A) three forces acting at a point are always in equilibrium
- (B) if three forces acting on a point can be represented in magnitude and direction by the sides of a triangle, the point will be in the state of equilibrium
- (C) three coplanar forces acting at a point will be in equilibrium, if each force is proportional to the sine of the angle between the other two
- (D) three coplanar forces acting at a point will be in equilibrium if each force is inversely proportional to the sine of the angle between the other two

108. The centre of gravity of a body is the point at which the whole

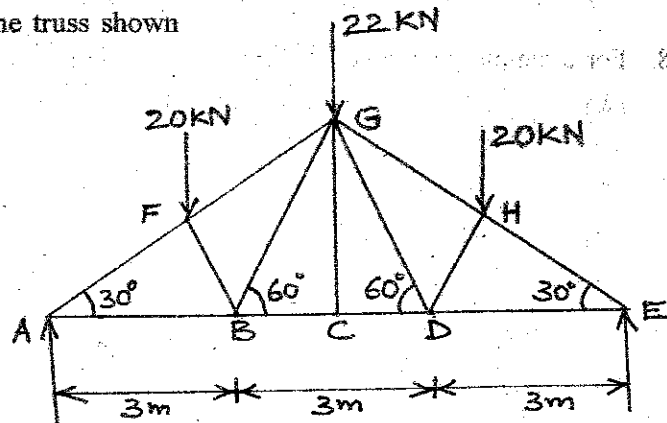
- (A) volume of the body is assumed to be concentrated
- (B) area of the surface of the body is assumed to be concentrated
- (C) weight of the body is assumed to be concentrated
- (D) all the above

109. Moment of inertia of a thin ring (external diameter, D and internal diameter, d) about an axis perpendicular to the plane of the ring, is

- (A) $\frac{\pi}{64} (D^4 + d^4)$
- (B) $\frac{\pi}{64} (D^4 - d^4)$
- (C) $\frac{\pi}{32} (D^4 + d^4)$
- (D) $\frac{\pi}{32} (D^4 - d^4)$

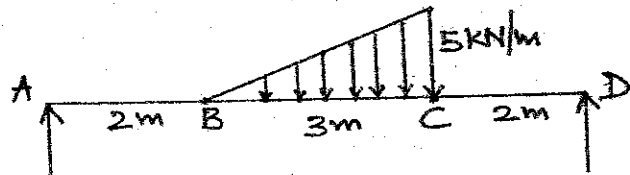
110. The force in the member GC of the truss shown

- (A) 20 KN
- (B) 22 KN
- (C) 5 KN
- (D) Zero



111. Find the reaction of support A of the beam shown

- (A) 3.45 KN
- (B) 3.22 KN
- (C) 4.28 KN
- (D) 4.05 KN



112. A roller support is provided at one end of the horizontal beam having concentrated load, uniformly varying load and an inclined load. The reaction of roller support is

- (A) Normal to the plane of support
- (B) Parallel to the plane of support
- (C) May be inclined to the plane of support depending upon the type of inclined load
- (D) Zero

113. The product of mass and velocity of a moving body is called
(A) moment (C) impulse
(B) momentum (D) power
114. The linear velocity (V) of a moving particle along the circumference of a circle of radius (r), with a uniform angular velocity (ω) will be given by
(A) $V = r\omega^2$ (C) $V = r/\omega$
(B) $V = r\omega$ (D) $V = \omega/r$
115. The motion of a bicycle wheel is
(A) translatory (C) rotary and translatory
(B) rotary (D) curvilinear
116. The train 'A' is moving towards east at 100 km/hr and train 'B' is moving towards west at 80 km/hr. What is the relative velocity of train 'B' with respect to train 'A' ?
(A) 180 km/hr (C) 80 km/hr
(B) 100 km/hr (D) 20 km/hr
117. Equation of motion of point in a straight line is
(A) $V = u + at$ (C) $S = ut + \frac{1}{2}at^2$
(B) $V^2 = u^2 + 2as$ (D) all the above
118. For a simple pendulum, time period for a beat is
(A) $\pi \sqrt{\frac{l}{g}}$ (C) $\pi \sqrt{\frac{l}{2g}}$
(B) $\pi \sqrt{\frac{2l}{g}}$ (D) $2\pi \sqrt{l/g}$
119. For perfectly elastic bodies, the value of coefficient of restitution is
(A) zero (C) 1.0
(B) 0.5 (D) Between 1.0 and 0
120. A ball of mass 1 kg moving with a velocity of 2m/sec collides directly on a stationary ball of mass 2 kg and comes to rest after impact. The velocity of second ball after impact will be
(A) zero (C) 1.0 m/sec
(B) 0.5 m/sec (D) 2.5 m/sec
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