

51. The peak of a 4 hour flood hydrograph is $240 \text{ m}^3/\text{sec}$ if the rainfall excess is 80 mm and base flow which is constant is $40 \text{ m}^3/\text{sec}$ then the peak of 4-hours unit hydrograph will be

- a. $20^3/\text{sec}$
- b. $25 \text{ m}^3/\text{sec}$
- c. $30 \text{ m}^3/\text{sec}$
- d. $35 \text{ m}^3/\text{sec}$

52. A cross-over of 1 in 10 exists between two broad gauge parallel tracks with centres at 5 m apart. The length of the straight track is

- (a) 16.4 m
- (b) 18.4 m
- (c) 19.2 m
- (d) 19.92 m

53. A 4-hour direct runoff hydrograph of a catchment is triangular in shape with a time of 100 hours and peak flow of $50 \text{ m}^3/\text{sec}$. the catchment area is 360 km^2 the flow of this catchment area for a 4-hour unit hydrograph is

- a. $10 \text{ m}^3/\text{sec}$
- b. $20 \text{ m}^3/\text{sec}$
- c. $25 \text{ m}^3/\text{sec}$
- d. $50 \text{ m}^3/\text{sec}$

54. Match List-I (Shape of tunnel) with List-II (Suitability for) and select the correct answer:

- | List – I | List – II |
|-----------------------------|-------------------|
| A. Circular section | 1. Soft rock |
| B. Horse-shoe section | 2. Hard rock |
| C. Egg-shaped | 3. Carrying water |
| D. Segmental - roof section | 4. Sewers |
| | 5. Subways |

Codes :

- a. A – 3, B – 4, C – 2, D – 1
- b. A – 3, B – 1, C – 4, D – 5
- c. A – 2, B – 1, C – 4, D – 3
- d. A – 1, B – 2, C – 3, D – 5

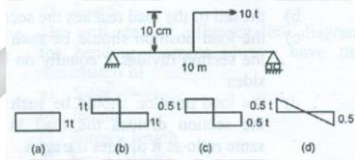
55. The rainfall in four successive 12 hour period on a catchment are 40, 80, 90 and 30 mm. if the infiltration index ϕ for the storm is 5 mm/hour, then the total surface run off will be

- a. 0
- b. 50 mm
- c. 120 mm
- d. 180 mm

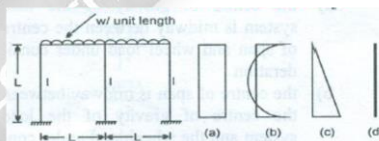
56. Which one of these methods of Tunnel Construction is not suitable in rocks?

- (a) Full face method
- (b) Compressed air method
- (c) Heading and benching method
- (d) Drift method

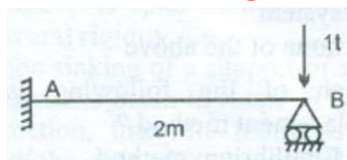
57. The correct shear force diagram for the beam shown below is



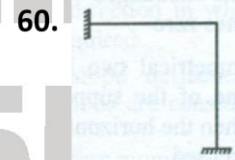
58. The correct bending moment diagram for the middle column of the frame shown below is



59. The reaction at support A of the propped cantilever beam shown in fig.



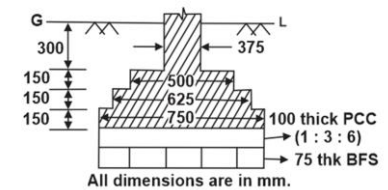
- a. 0
- b. 1 t
- c. 0.5 t
- d. 2 t



What is the degree of static indeterminacy of the structure shown in fig

- a. 1
- b. 2
- c. 3
- d. 4

61. The cross-section of a strip footing is shown below:



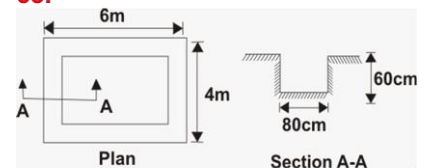
The quantity of BFS under the footing per meter length is

- OP 1 : 0.750 Cu. m
- OP 2 : 0.750 Sq. m
- OP 3 : 0.056 Cu. m
- OP 4 : 0.056 Sq. m

62. If 'd' be the diameter of MS of tor steel bars in mm, the standard weight (in kg) per meter of the bar is:

- OP 1 : 0.00618 d^2
- OP 2 : 0.00618 d
- OP 3 : 0.00816 d^2
- OP 4 : 0.00816 d

63.



The above figure represents plan and section of an excavation layout. the values of earthwork in excavation of foundation trench is:

- OP 1 : 6.528 Cu. m
- OP 2 : 8.064 Cu. m
- OP 3 : 8.832 Cu. m
- OP 4 : 9.600 Cu. M

64. The plan of a building is in the form of a rectangle with centre line dimensions of the outer walls as 10.3 m × 15.3 m. The thickness of the walls in superstructure is 0.3 m. Then its carpet area is :

- OP 1 : 150 m²
 OP 2 : 157.59 m²
 OP 3 : 165.36 m²
 OP 4 : 170 m²

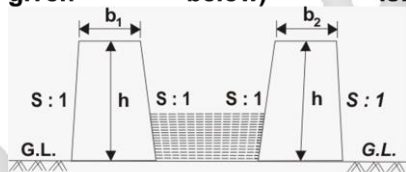
65. Using straight line method annual depreciation D is equal to:

- OP 1 : $\frac{\text{Life in Year} - \text{Scrap value}}{\text{Original cost}}$
 OP 2 : $\frac{\text{Scrap value} - \text{Life in Year}}{\text{Original cost}}$
 OP 3 : $\frac{\text{Original cost} - \text{Life in year}}{\text{Scrap value}}$
 OP 4 : $\frac{\text{Original cost} - \text{Scrap value}}{\text{Life in year}}$

66. The plan of a building is in the form of a rectangle with Center line dimensions of outer wall as 14.7m × 9.7m. The thickness of the wall in super structure is 0.30 m. What is the floor area of the building?

- OP 1 : 143 m²
 OP 2 : 139 m²
 OP 3 : 152 m²
 OP 4 : None of these

67. The cross-section area of the embankment of a canal fully in embankment; (refer the figure given below) is:



- OP 1 : $\frac{1}{2} [b_1 + b_2] h$
 OP 2 : $(b_1 + b_2) h + s h^2$
 OP 3 : $(b_1 + b_2) h + s h^2$
 OP 4 : $2 [(b_1 + b_2)(b + s h)]$

68. The plan of a building is in the form of a rectangle with Center line dimensions of outer walls as 9.7m × 14.7 m. The thickness of the walls in super-structure is 0.30m. Then its plinth area is

- OP 1 : 150 m²
 OP 2 : 147 m²
 OP 3 : 145.50 m²
 OP 4 : 135.36 m²

69. Calculate the annual depreciation (Rs.) of a machine having initial cost of Rs. 10000. The scrap value is Rs. 1000 and useful life of 30 years.

- OP 1 : 300
 OP 2 : 367
 OP 3 : 1333
 OP 4 : 333333

70. Calculate the cost (Rs.) of 100mm thick brick lining of a septic tank of size 5m × 3m × 1.5m, if the rate of lining of Rs. 200 per square meter.

- OP 1 : 4500
 OP 2 : 4800
 OP 3 : 5400
 OP 4 : 7800

71. The length width and height of a wall are given as 800 cm, 500 cm respectively, what will be the total cost (Rs.) of brick work. If the rate of brickwork is Rs.320 per cubic meter?

- OP 1 : 4000
 OP 2 : 6400
 OP 3 : 10500
 OP 4 : 12860

72. The plinth area rate and plinth area of a building is Rs. 5500 per Sq.m respectively. What is the total cost (Rs.) of building considering cost of electrification as 7% cost of sanitary fittings as 16% cost of roads and lawns as 6.5% and cost of contingencies as 4.5%

- OP 1 : 50000
 OP 2 : 825000
 OP 3 : 982860
 OP 4 : 1105500

73. A surge tank is provided in hydropower schemes to

- OP 1 : Reduce water hammer pressure
 OP 2 : Reduce frictional losses
 OP 3 : Increase the net head
 OP 4 : Strengthen the penstock

74. Francis turbine is

- OP 1 : A reaction turbine
 OP 2 : An impulse turbine
 OP 3 : A tangential flow impulse turbine
 OP 4 : An axial flow turbine

75. In the section of turbine by specific speed or head, which one of the following statements is not correct?

- OP 1 : For specific speed 10-35, Kaplan turbines
 OP 2 : For specific speed 60-300, Kaplan turbines
 OP 3 : For head 50-150m, Francis turbines
 OP 4 : For head above 300 m, Pelton wheel

76. Which of the following turbine is suitable to generate the power of 10000 hp, working at the speed of 500 rpm under a head of 81 m?

- OP 1 : Propeller
 OP 2 : Francis
 OP 3 : Kaplan
 OP 4 : Pelton

77. The head developed by the centrifugal pump is 40 m while operating at the speed of 750 rpm. If the rated capacity is given as 50 cumec. What is the specific speed of centrifugal pump?

- OP 1 : 150
 OP 2 : 300
 OP 3 : 333
 OP 4 : 500

78. The power of the pump is given as 30 HP. What is the equivalent power expressed in watts?

- OP 1 : 20000
 OP 2 : 22380
 OP 3 : 25742
 OP 4 : 30500

79. In the hydel system, a forebay is used at the junction of

- OP 1 : Penstock and turbine
 OP 2 : Power channel and penstock
 OP 3 : Power channel and tail race Channel
 OP 4 : Tail race channel and penstock

80. What is the specific speed of centrifugal pump, which has a rated capacity of 44 cumec and a head of 36 m when operated at the speed of 725 rpm?

- OP 1 : 45
 OP 2 : 225
 OP 3 : 327
 OP 4 : 350

81. If the two exactly same pumps are running at the same speed and lift the water at the head of 20 m and 30 m respectively. What is the diameter of impeller of second pump if the diameter (mm) of impeller of first pump is 500 mm?

- OP 1 : 430.2
- OP 2 : 500.5
- OP 3 : 612.5
- OP 4 : 714.3

82. Which of the following is a non-recording rain gauge?

- OP 1 : Symon's rain gauge
- OP 2 : Weighing type rain gauge
- OP 3 : Floating type rain gauge
- OP 4 : None of these

83. Calculate the evaporation (mm) from a pond, if the pan evaporation is 45 mm, the pan coefficient is 0.70

- OP 1 : 13.5
- OP 2 : 19.28
- OP 3 : 31.5
- OP 4 : 64.28

84. The intensity of the rainfall for successive 1 hours period of a 6 hours storm are 2,6,8,9,7 and 3 cm/hr. Calculate the $\phi\phi$ -index (cm./hr).

- OP 1 : 2.5
- OP 2 : 3.5
- OP 3 : 4.6
- OP 4 : 7.67

85. Calculate the runoff (cm) from a rainfall of 3 hours. The intensity of the rainfall is 2 cm/hr. The evaporation and infiltration losses are 8 mm and 16 mm

- OP 1 : 1.2
- OP 2 : 2.8
- OP 3 : 3.6
- OP 4 : 6.8

86. What is the rainfall intensity (mm/hr) according to the formula given by British Ministry of Health, if the time of concentration is 540 second?

- OP 1 : 20
- OP 2 : 30
- OP 3 : 40
- OP 4 : 50

87. The discharge capacity required at the outlet to irrigate at the outlet to irrigate 2600 ha of sugarcane having a kor depth of 17 cm and a kor period of 30 days is

- OP 1 : 2.3 m³/s
- OP 2 : 1.71 m³/s
- OP 3 : 14.7 m³/s
- OP 4 : 0.18 m³/s

88. Intensity of irrigation _____.

- OP 1 : Is the percentage of culturable commanded area proposed to be irrigated annually
- OP 2 : Is always more than 100%
- OP 3 : Is the percentage that could be ideally irrigated
- OP 4 : All the options are correct

89. The field irrigation requirement is computed as ____.

- OP 1 : Consumptive use + field application losses
- OP 2 : Net irrigation requirement + field application losses
- OP 3 : Net irrigation requirement + conveyance losses
- OP 4 : Consumptive use + conveyance losses

90. The field capacity of a soil is 25%, its permanent wilting point is 15% and specific dry unit weight is 1.5. If the depth of root zone of crop is 80 cm, the storage capacity of the soil is

- OP 1 : 8 cm
- OP 2 : 10 cm
- OP 3 : 12 cm
- OP 4 : 14 cm

91. If the irrigation efficiency is 80% conveyance losses are 20% and the actual depth of watering is 16 cm, the depth of water required at the canal outlet is

- OP 1 : 10 cm
- OP 2 : 15 cm
- OP 3 : 20 cm
- OP 4 : 25 cm

92. A field of 500 hectares is to be irrigated for a particular crop having 100 days base period. The total depth of water required by the crop is 100 cm. Calculate the duty of the water (in hectares per cubic meter).

- OP 1 : 8.64
- OP 2 : 57.87
- OP 3 : 86.4
- OP 4 : 864

93. In an irrigated field, the net irrigation requirement is 15 cm, the application efficiency is 80% and water conveyance efficiency is 60%. What is the gross irrigation requirement (in cm)?

- OP 1 : 11.25
- OP 2 : 18.75
- OP 3 : 25
- OP 4 : 31.25

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