

# **NOTICE**

**Ref. Advt. No. 05/2020**

## **SYAMA PRASAD MOOKERJEE PORT – KOLKATA HALDIA DOCK COMPLEX**

(Jawahar Tower Complex, Haldia Township,  
Purba Medinipur, West Bengal, Pin – 721607)

### **Written Examination for selection of Jr. Engineer (on contract) under I&CF Division of Haldia Dock Complex**

<b>Written Test Venue</b>	: DAV Public School, Haldia Township. P.O. – Haldia Township, Dist.-Purba Medinipur, West Bengal – 721607.
<b>Date of Test</b>	: 21/02/2021
<b>Reporting Time</b>	: 1030 hrs.
<b>Model Question Paper with Answer</b>	: Attached.
<b>Question Paper</b>	: <b>Total Marks: 100</b> <b>Overall Qualifying Marks: 50</b> (Each Candidate needs to qualify both in Section-A & Section-B separately as per the qualifying marks stated in the respective Section.)
<b>Question paper Duration</b>	: <b>180 Mins.</b>

### **General Instructions to the candidates:**

- Admit card have been issued to the prima-facie eligible candidates both by speed posts and also by email. If the candidate does not receive admit card by post, he/she may also take a print out of the e-mail (soft copy) of the admit card.
- The candidate must bring the admit card with recent passport size photograph affixed in the space provided and the filled in self-declaration at the time of appearing for the written examination. No candidate will be permitted to enter the examination Centre without the admit card with fill up the self-declaration about their Health status.
- The admit card along with affixed passport size photograph will be collected in the examination hall and therefore the candidate is advised to keep one photocopy of the Admit Card for his/ her own reference.
- Candidate must carry at least one photo bearing IDENTITY PROOF in original such as Passport, Driving License, Voter Card, Aadhaar Card, Identity Card issued by University / College, Pan Card **along with a self-certified photocopy of the same**, to the examination Centre, failing which, HE/SHE SHALL NOT BE ALLOWED TO APPEAR FOR THE EXAMINATION.
- The candidate should reach the examination Centre / Venue at the reporting time. Late comers will not be permitted to appear in the test. **They should bring 2 good quality BLACK/BLUE ball point pen for answering the test questions. Use of Pencils is strictly prohibited for answering questions.**
- Candidature for the test is provisional and subject to fulfilling all the eligibility conditions as indicated in the advertisement. Receipt of Admit card by the candidate is not to be construed as

acceptance of the candidate's eligibility for selection. If, at any stage, it is found that the candidate is ineligible for sitting in the written examination or at any subsequent stage his / her candidature will be rejected.

- Candidates are not allowed to carry any papers, notes, books, calculators, pagers or mobile phone or electronic devices etc., in the examination hall. Any candidate found using or in possession of such unauthorised material or indulging in copying or adopting unfair means, is liable to be summarily disqualified.
- Request for change of centre / venue will not be entertained under any circumstances.
- No Travelling allowance will be reimbursed for appearing in the Written Test.
- Candidates are required to comply with the Government COVID-19 related safety protocols for the examination as prescribed therein. The important COVID-19 safety guidelines are given overleaf.
- Candidates are required to wear Facemask and carry their own water bottle, Hand Sanitizer etc. inside the examination hall.
- Candidates shall be allowed entry only if using Face Mask / Face Cover and the Face Mask / Face Cover has to be worn properly all times inside the examination center. They have to undergo mandatory Thermal Screening and Hand Sanitization before entering into the Examination Centre.
- Candidates shall be permitted to enter the examination Centre only if they are not having any COVID-19 symptoms. HDC reserves the right to allow / disallow entry of candidates subject to COVID-19 Protocol.
- Candidates are required to maintain physical distance when queuing up for entry.
- Bags/Books/Mobiles etc. shall not be allowed in the Examination hall. Designated space would be provided by HDC for keeping such items.
- Spitting in and around is strictly prohibited. Use of spit/saliva for counting /turning question paper/Answer Sheet is also strictly prohibited.
- Sharing of personal belongings / stationary shall not be allowed.
- Candidates are also requested to go through the detailed Government COVID-19 guidelines given below.

### **The Government guideline on preventive measures to be followed by the candidates while appearing for the written examination to contain spread of Covid-19**

#### **1. Generic preventive measures**

The generic measures include simple public health measures that are to be followed to reduce the risk of COVID-19. These measures need to be observed by all (candidates and parents) in these places at all times.

These include:

- i. Physical distancing of at least 6 feet to be followed as far as feasible.
- ii. Use of face covers/masks to be made mandatory.
- iii. Practice frequent hand washing with soap (for at least 40-60 seconds) even when hands are not visibly dirty. Use of alcohol-based hand sanitizers (for at least 20 seconds) can be made wherever feasible.

- iv. Respiratory etiquette to be strictly followed. This involves strict practice of covering one's mouth and nose while coughing/sneezing with a tissue/handkerchief/flexed elbow and disposing off used tissues properly.
- v. Self-monitoring of health by all and reporting any illness at the earliest.
- vi. Spitting shall be strictly prohibited.
- vii. Installation & use of Aarogya Setu App shall be advised to all, as far as feasible.

## **2. Entry and Exit to the examination center**

- i. Entrances to have mandatory hand hygiene and thermal screening provisions. If any examination functionary/examinee fails to meet the self-declaration criteria, they shall not be allowed entry.
- ii. Only asymptomatic staff and students shall be allowed inside the examination hall.
- iii. In regular course, a symptomatic candidate should be referred to the nearest health center and given an opportunity to undertake the examination through other means or the Universities/Educational Institution shall arrange for taking exam at a later date when the student is declared physically fit. However, if a student is found to be symptomatic, the permission or denial thereof, in such cases shall be granted as per the policy already enunciated on the issue by the Examination Conducting Authorities.
- iv. All staff and students to be allowed entry only if using face cover/masks. The face cover/mask has to be worn at all times inside the examination center by all.
- v. Enough entry & exits gates for students and staff shall be ensured to avoid overcrowding.
- vi. Maintaining physical distancing of a minimum of 6 feet, when queuing up for entry and inside the center as far as feasible.
- vii. Specific markings may be made with sufficient distance to manage the queue and ensure social distancing in the premises.
- viii. Proper crowd management in the examination center as well as outside premises like parking lots, waiting areas — duly following physical distancing norms shall be ensured.
- ix. Bags/books/mobiles should not be allowed in the examination center.
- x. The examinees will be taken to a registration room in batches maintaining adequate physical distancing norms for document verification and recording of attendance. Thereafter they will be escorted in batches to the allotted examination hall.
- xi. Frisking of examinees, if needed, shall be undertaken after thermal screening. Personnel involved in frisking shall wear triple layer medical mask in addition to gloves. Proper hand hygiene shall be maintained by such personnel every time they change their gloves.
- xii. On completion of exam, the candidates should be permitted to move out in an orderly manner.

## MODEL QUESTION PAPER(CIVIL)

### Written Test for selection to the post of Junior Engineer under I &CF Division

Total duration –3 hr

Full marks – 100

Qualifying Marks-50

Note: The Question paper consists of three Sections A, B & C.

#### Criteria for qualification in the Examination:

Each Candidate needs to qualify both in Section-A & Section-B separately as per the qualifying marks stated in the respective Section. Apart from that, each Candidate also needs to score at least 50 in overall for Qualifying in the Examination.

#### SECTION-A

Full Marks-40

Qualifying Marks-20

Objective type Questions

Please read the Questions carefully and write answers in the demarcated space. [40 x 1=40]

1. For testing compressive strength of cement, the cement mortar is made by mixing cement and standard sand in the proportion of :

- a) 1:1
- b) 1:2
- c) 1:3
- d) 1:4

Answer:

2. If the percentage of water required for normal consistency is ‘P’, water to be added for determination of initial setting time, is

- a) 0.70P
- b) 0.75P
- c) 0.80P
- d) 0.85P

Answer:

3. The most commonly used retarder in cement is

- a) Gypsum
- b) Calcium Chloride

- c) Calcium Carbonate
- d) None of the above

**Answer:**

**4. The size of mould for bricks is generally kept**

- a) A little large to specified size
- b) a little small to specified size
- c) equal to specified size
- d) 10% larger than specified size

**Answer:**

**5. For one cubic meter of brick masonry, number of traditional bricks (248 x 121 x 71mm) required is**

- a) 389
- b) 425
- c) 450
- d) 500

**Answer:**

**6. The process of mixing clay with water and other ingredients of bricks is known as**

- a) Tempering
- b) Pugging
- c) Kneading
- d) Moulding

**Answer:**

**7. Seasoning of timber is essential to remove**

- a) Roughness of timber
- b) Twisted fibre of timber
- c) Sap of Timber
- d) Skin of timber

**Answer:**

**8. The minimum compressive strength of bricks with Class designation – 10 should be**

- a) 7.5N/mm<sup>2</sup>
- b) 9.0N/mm<sup>2</sup>
- c) 10N/mm<sup>2</sup>

d)  $12\text{N/mm}^2$

**Answer:**

**9. The brick laid with its length parallel to the length of wall called**

- a) Header
- b) Closer
- c) Stretcher
- d) None of the above

**Answer:**

**10. Strength of cement concrete primarily depends upon**

- a) Quality of water
- b) Quality of aggregates
- c) Quantity of cement
- d) Water cement ratio

**Answer:**

**11. Volume of sand when just saturated with water is**

- a) Equal to the original dry volume
- b) Less than original dry volume
- c) More than original dry volume
- d) None of the above

**Answer:**

**12. For a longitudinal reinforcing bar in a column, the minimum cover shall neither be less than the diameter of bar nor less than**

- a) 15mm
- b) 25mm
- c) 30mm
- d) 40mm

**Answer:**

**13. IS code of concrete mix design is**

- a) IS: 10262
- b) IS: 455
- c) IS: 458
- d) IS: 814

**Answer:**

**14. In order that flow takes place between two points in a pipe line, the differential pressure between these points must be more than**

- a) Frictional force
- b) Viscosity
- c) Surface friction
- d) All of the above

**Answer:**

**15. The mass of 2.5 Cum of certain liquid is 2 tonnes. Its mass density is**

- a) 5Kg/Cum
- b) 400Kg/Cum
- c) 600Kg/Cum
- d) 800Kg/Cum

**Answer:**

**16. Pile foundation generally provided if soil is**

- a) Compressible
- b) Water logged
- c) Made up
- d) All the above

**Answer:**

**17. A body dimension 1.5mx1.0mx2.0 weighs 3300 Kg in water. Its specific gravity is**

- a) 0.8
- b) 0.9
- c) 1.0
- d) 1.1

**Answer:**

**18. Vicat apparatus is used to perform the**

- a) Fineness test of cement
- b) Soundness test of cement
- c) Strength of cement
- d) Determining the setting time of cement

**Answer:**

**19. What is Air Quality Index?**

- a) It tells about the sound pollution.
- b) It measures air pollution mainly Sulphur content in the air.
- c) It measures ozone levels in your area.
- d) It checks the colour of the air.

**Answer:**

**20. Water pollution has become a major problem in the world today. It has an adverse effect on both the environment and health. What are the main sources of water pollution in India?**

- a) Municipal Sewage
- b) Bathing
- c) Industrial Discharge
- d) Both A and C

**Answer:**

**21. Which of the following organisms found in human waste that causes water pollution?**

- a) Coliform bacteria
- b) Viruses
- c) Protozoa
- d) Parasitic worms

**Answer:**

**22. The main principle of surveying is to work**

- a) From part to the whole
- b) From whole to the part
- c) From higher level to the lower level
- d) From lower level to higher level

**Answer:**

**23. The angle between two plane mirrors of an optical square, is**

- a) 30 degree
- b) 45 degree
- c) 60 degree
- d) 90 degree

**Answer:**

**24. The back staff reading on a B.M. of R.L. 8.500m is 2.685m. If foresight reading on a point is 1.345m, the reduced level of the point, is**

- a) 11.185m

- b) 9.84m
- c) 9.845m
- d) 12.53m

**Answer:**

**25. Before discharging the foul sewage into rivers, it is generally treated by**

- a) Screening
- b) Sedimentation
- c) Oxidation
- d) all of the above

**Answer:**

**26. Run off is measured in**

- a) cubic metres
- b) cubic metres per sec.
- c) cubic metres per minutes
- d) cubic metres per hour

**Answer:**

**27. The earthen embankments constructed parallel to the river banks at some suitable distance for flood control, are known as**

- a) Flood walls
- b) Dikes
- c) Levees
- d) Both B and C

**Answer:**

**28. When the R.L. of the water source is higher than the R.L. of the consumer's place, water is generally supplied**

- a) By pumping system
- b) By gravitational system
- c) Both (a) & (b)
- d) All the above

**Answer:**

**29. The brick work is not measures in cum in case of**

- a) 250mm thick wall
- b) 375mm thick wall
- c) 500mm thick wall
- d) 125mm thick wall

**Answer:**

**30. If no super elevation is provided on a rod along curves, potholes may occur at**

- a) Inner edge of the road
- b) Outer edge of the road
- c) Centre of the road
- d) Nowhere on the road

**Answer:**

**31. Slump test of concrete is performed to determine**

- a) Strength of concrete
- b) Quantity of Cement
- c) Workability
- d) None of the above

**Answer:**

**32. Strength of concrete primarily depends on**

- a) Aggregate-Cement Ratio
- b) Quantity of Cement
- c) Water-Cement Ratio
- d) None of the above

**Answer:**

**33. IS Code for testing of drinking water is**

- a) IS 10500
- b) IS 456
- c) IS 800
- d) None of the above

**Answer:**

**34. pH value of drinking water is**

- a) 3
- b) 6
- c) 7 to 8.5
- d) None of the above

**Answer:**

**35. Damp Proof Course in a residential Building is provided at**

- a) Roof level
- b) Sill level
- c) Plinth level
- d) None of the above

**Answer:**

**36. A coating of structural steel with zinc is termed as**

- a) Anodisation
- b) Galvanisation
- c) Oxidation
- d) None of the above

**Answer:**

**37. Minimum permissible individual compressive strength of M50 concrete Paver Block is**

- a) 50N/mm<sup>2</sup>
- b) 42.5N/mm<sup>2</sup>
- c) 40N/mm<sup>2</sup>
- d) None of the above

**Answer:**

**38. Maximum Bending Moment of a simply supported beam of length 'L' carrying UDL 'W' is**

- a)  $WL^2/10$
- b)  $WL^2/5$
- c)  $WL^2/8$
- d) None of the above

**Answer:**

**39. Bending Moment at support of a beam of length 'L' with both ends fixed carrying UDL 'W' is**

- a)  $WL^2/10$
- b)  $WL^2/5$
- c)  $WL^2/16$
- d) None of the above

**Answer:**

**40. Multiplying factor for painting of one side of paneled door is**

- a) 1.3
- b) 1.1
- c) 0
- d) None of the above

**Answer:**

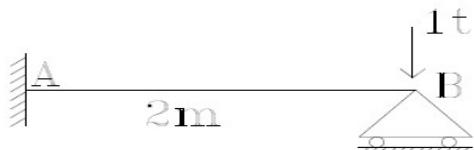
## SECTION - B

**Full Marks-36**

**Qualifying Marks-18**

**B.1: Please read the Questions carefully and write answers in the demarcated space.[2 x 2=4]**

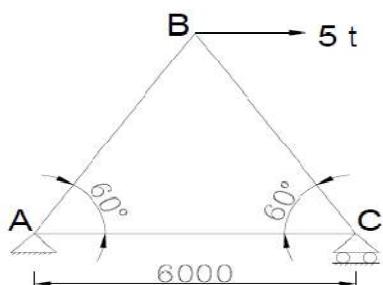
**1. The Vertical reaction at support A of the propped cantilever beam shown in Fig. below is**



- (a) 0
- (b) 1 t
- (c) 0.5 t
- (d) 2 t

**Answer:**

**2. Force in the member BC of the truss shown in Figure is**



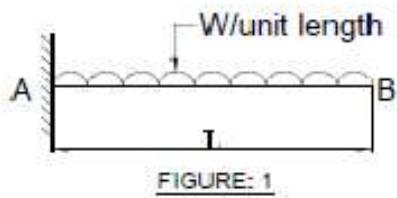
**FIGURE**

- (a) 5 t, tensile
- (b) zero
- (c) 2.88 t, compressive
- (d) 5 t, compressive

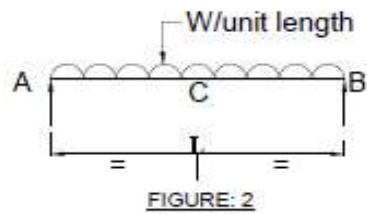
**Answer:**

**B.2: Draw the bending moment diagram of the following: [4 x 5=20]**

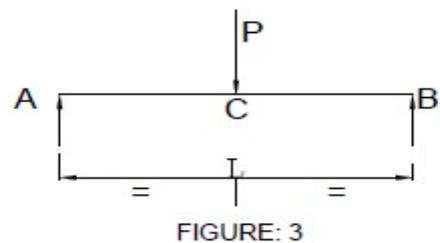
1. Draw the bending moment diagram of Figure-1 below indicating the value at A.



2. Draw the bending moment diagram of Figure-2 below indicating the value at C.



3. Draw the bending moment diagram of Figure-3 below indicating the value at C.



4. Draw the bending moment diagram of Figure-4 below indicating the value at C.

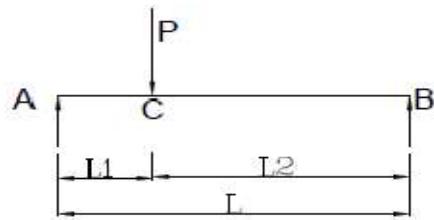
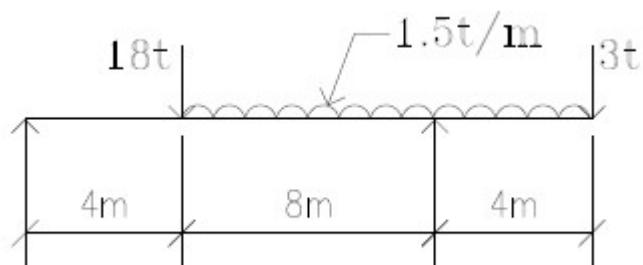


FIGURE: 4

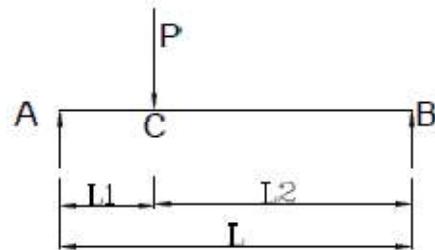
**B.3:Draw the Shear Force diagram of the following indicating its value at important points :**

[2 x 4=8]

1.

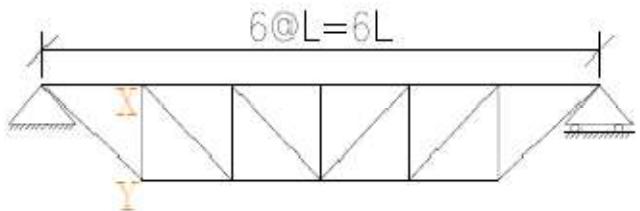


2.



**B.4: Draw influence line diagram for force in member 'XY' of the truss shown in the figure below:**

[1 x 4 =4]



## **SECTION - C**

**Full Marks-24**

**C.1: Write short notes (Any Four):**

**[5 x 4=20]**

- a) Bulking of sand
- b) Slump Test
- c) Limitation for Bar Chart
- d) Gradient,
- e) Construction Joint
- f) Hardness in water
- g) Gully Trap
- h) Tack coat

**C.2: Write five sentences about current pandemic situation of Covid-19/Amphan.**

**[4]**

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**ANSWER SHEET(CIVIL)**

**SECTION-A**

**Full Marks-40**

**Qualifying Marks-20**

**Objective type Questions**

**Please read the Questions carefully and write answers in the demarcated space. [40 x 1=40]**

- 1. For testing compressive strength of cement, the cement mortar is made by mixing cement and standard sand in the proportion of :**
  - a) 1:1
  - b) 1:2
  - c) 1:3
  - d) 1:4

**Answer: (c)**

- 2. If the percentage of water required for normal consistency is 'P ', water to be added for determination of initial setting time, is**
  - a)  $0.70P$
  - b)  $0.75P$
  - c)  $0.80P$
  - d)  $0.85P$

**Answer: (d)**

- 3. The most commonly used retarder in cement is**
  - a) Gypsum
  - b) Calcium Chloride
  - c) Calcium Carbonate
  - d) None of the above

**Answer: (a)**

- 4. The size of mould for bricks is generally kept**

- a) A little large to specified size
- b) a little small to specified size
- c) equal to specified size
- d) 10% larger than specified size

**Answer: (d)**

**5. For one cubic meter of brick masonry, number of traditional bricks (248 x 121 x 71mm) required is**

- a) 389
- b) 425
- c) 450
- d) 500

**Answer: (a)**

**6. The process of mixing clay with water and other ingredients of bricks is known as**

- a) Tempering
- b) Pugging
- c) Kneading
- d) Moulding

**Answer: (b)**

**7. Seasoning of timber is essential to remove**

- a) Roughness of timber
- b) Twisted fibre of timber
- c) Sap of Timber
- d) Skin of timber

**Answer: (c)**

**8. The minimum compressive strength of bricks with Class designation – 10 should be**

- a) 7.5N/mm<sup>2</sup>
- b) 9.0N/mm<sup>2</sup>

- c)  $10\text{N/mm}^2$
- d)  $12\text{N/mm}^2$

**Answer: (c )**

**9. The brick laid with its length parallel to the length of wall called**

- a) Header
- b) Closer
- c) Stretcher
- d) None of the above

**Answer: (c )**

**10. Strength of cement concrete primarily depends upon**

- a) Quality of water
- b) Quality of aggregates
- c) Quantity of cement
- d) Water cement ratio

**Answer: (d)**

**11. Volume of sand when just saturated with water is**

- a) Equal to the original dry volume
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**Answer: (b)**

**12. For a longitudinal reinforcing bar in a column, the minimum cover shall neither be less than the diameter of bar nor less than**

- a) 15mm
- b) 25mm
- c) 30mm
- d) 40mm

**Answer: (b)**

**13. IS code of concrete mix design is**

- a) IS: 10262
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- c) IS: 458
- d) IS: 814

**Answer: (a)**

**14. In order that flow takes place between two points in a pipe line, the differential pressure between these points must be more than**

- a) Frictional force
- b) Viscosity
- c) Surface friction
- d) All of the above

**Answer:(d)**

**15. The mass of 2.5 Cum of certain liquid is 2 tonnes. Its mass density is**

- a) 5Kg/Cum
- b) 400Kg/Cum
- c) 600Kg/Cum
- d) 800Kg/Cum

**Answer: (d)**

**16. Pile foundation generally provided if soil is**

- a) Compressible
- b) Water logged
- c) Made up
- d) All the above

**Answer: (d)**

**17. A body dimension 1.5mx1.0mx2.0 weighs 3300 Kg in water. Its specific gravity is**

- a) 0.8
- b) 0.9
- c) 1.0
- d) 1.1

**Answer: (d)**

**18. Vicat apparatus is used to perform the**

- a) Fineness test of cement
- b) Soundness test of cement
- c) Strength of cement
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**Answer: (d)**

**19. What is Air Quality Index?**

- a) It tells about the sound pollution.
- b) It measures air pollution mainly Sulphur content in the air.
- c) It measures ozone levels in your area.
- d) It checks the colour of the air.

**Answer: (b)**

**20. Water pollution has become a major problem in the world today. It has an adverse effect on both the environment and health. What are the main sources of water pollution in India?**

- a) Municipal Sewage
- b) Bathing
- c) Industrial Discharge
- d) Both A and C

**Answer: (d)**

**21. Which of the following organisms found in human waste that causes water pollution?**

- a) Coliform bacteria
- b) Viruses
- c) Protozoa
- d) Parasitic worms

**Answer: (a)**

**22. The main principle of surveying is to work**

- a) From part to the whole
- b) From whole to the part
- c) From higher level to the lower level
- d) From lower level to higher level

**Answer: (b)**

**23. The angle between two plane mirrors of an optical square, is**

- a) 30 degree
- b) 45 degree
- c) 60 degree
- d) 90 degree

**Answer: (b)**

**24. The back staff reading on a B.M. of R.L. 8.500m is 2.685m. If foresight reading on a point is 1.345m, the reduced level of the point, is**

- a) 11.185m
- b) 9.84m
- c) 9.845m
- d) 12.53m

**Answer: (b)**

**25. Before discharging the foul sewage into rivers, it is generally treated by**

- a) Screening
- b) Sedimentation
- c) Oxidation
- d) all of the above

**Answer: (d)**

**26. Run off is measures in**

- a) cubic metres
- b) cubic metres per sec.
- c) cubic metres per minutes
- d) cubic metres per hour

**Answer: (b)**

**27. The earthen embankments constructed parallel to the river banks at some suitable distance for fold control, are known as**

- a) Floods walls

- b) Dikes
- c) Levees
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**Answer: (d)**

**28. When the R.L. of the water source is higher than the R.L. of the consumer's place, water is generally supplied**

- a) By pumping system
- b) By gravitational system
- c) Both (a) & (b)
- d) All the above

**Answer: (b)**

**29. The brick work is not measures in cum in case of**

- a) 250mm thick wall
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**Answer: (d)**

**30. If no super elevation is provided on a rod along curves, potholes may occur at**

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**Answer: (b)**

**31. Slump test of concrete is performed to determine**

- a) Strength of concrete
- b) Quantity of Cement
- c) Workability
- d) None of the above

**Answer: (c )**

**32. Strength of concrete primarily depends on**

- a) Aggregate-Cement Ratio
- b) Quantity of Cement
- c) Water-Cement Ratio
- d) None of the above

**Answer: (c )**

**33. IS Code for testing of drinking water is**

- a) IS 10500
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- d) None of the above

**Answer: (a)**

**34. pH value of drinking water is**

- a) 3
- b) 6
- c) 7 to 8.5
- d) None of the above

**Answer: (c )**

**35. Damp Proof Course in a residential Building is provided at**

- a) Roof level
- b) Sill level
- c) Plinth level
- d) None of the above

**Answer : (c )**

**36. A coating of structural steel with zinc is termed as**

- a) Anodisation
- b) Galvanisation
- c) Oxidation
- d) None of the above

**Answer: (b)**

**37. Minimum permissible individual compressive strength of M50 concrete Paver Block is**

- a) 50N/mm<sup>2</sup>
- b) 42.5N/mm<sup>2</sup>
- c) 40N/mm<sup>2</sup>
- d) None of the above

**Answer: (b)**

**38. Maximum Bending Moment of a simply supported beam of length 'L' carrying UDL 'W' is**

- a)  $WL^2/10$
- b)  $WL^2/5$
- c)  $WL^2/8$
- d) None of the above

**Answer: (c )**

**39. Bending Moment at support of a beam of length 'L' with both ends fixed carrying UDL 'W' is**

- a)  $WL^2/10$
- b)  $WL^2/5$
- c)  $WL^2/16$
- d) None of the above

**Answer: (d)**

**40. Multiplying factor for painting of one side of paneled door is**

- a) 1.3
- b) 1.1
- c) 0
- d) None of the above

**Answer: (b)**

## **SECTION - B**

**Full Marks-36**

**Qualifying Marks-18**

**B1: Please read the Questions carefully and write answers in the demarcated space. [2 x 2=4]**

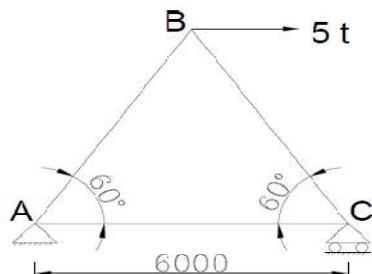
1. The Vertical reaction at support A of the propped cantilever beam shown in Fig. below is



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

**Answer: (a)**

2. Force in the member BC of the truss shown in Figure is



**FIGURE**

- a) 5 t, tensile
- b) Zero
- c) 2.88 t, compressive
- d) 5 t, compressive

**Answer: (d)**

**B.2: Draw the bending moment diagram of the following:**

[4 x 5=20]

1. Draw the bending moment diagram of Figure-1 below indicating the value at A.

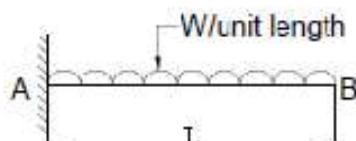
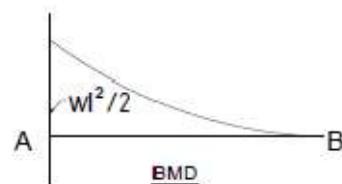


FIGURE: 1

**Answer :**



BM drawn on tension side

2. Draw the bending moment diagram of Figure-2 below indicating the value at C.

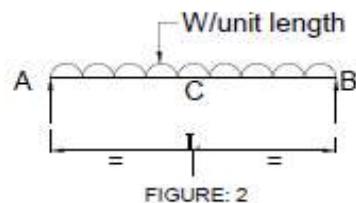
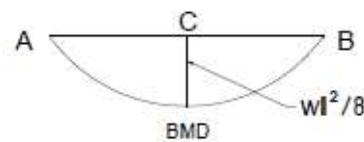


FIGURE: 2

**Answer :**



BM drawn on tension side

3. Draw the bending moment diagram of Figure-3 below indicating the value at C.

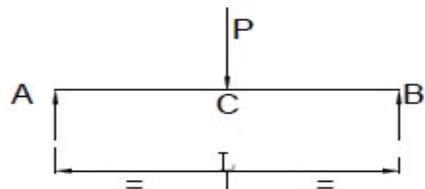
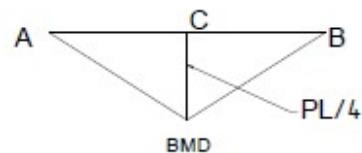


FIGURE: 3

**Answer:**



**BM drawn on tension side**

4. Draw the bending moment diagram of Figure-4 below indicating the value at C.

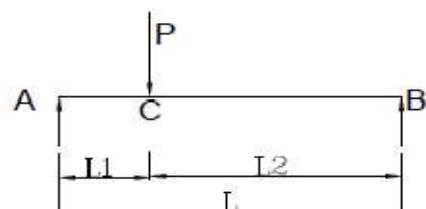
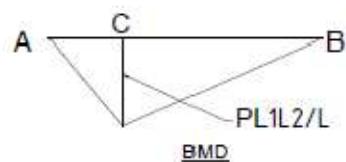


FIGURE: 4

**Answer:**

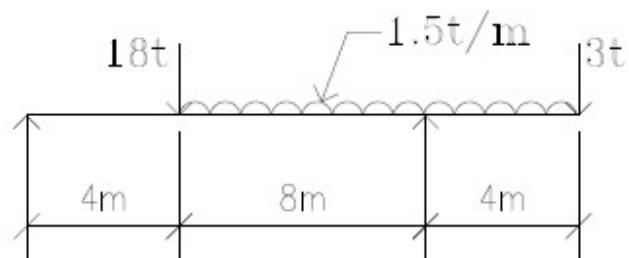


BM drawn on tension side

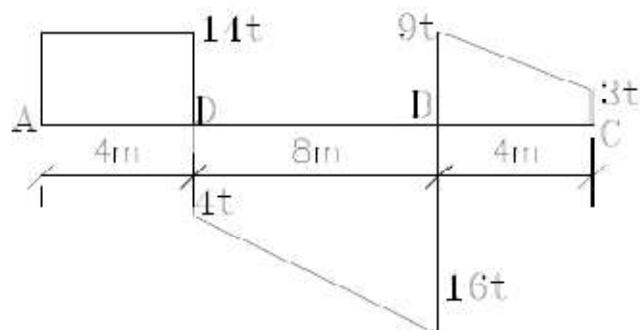
**B.3: Draw the Shear Force diagram of the following indicating its value at important points:**

[2 x 4=8]

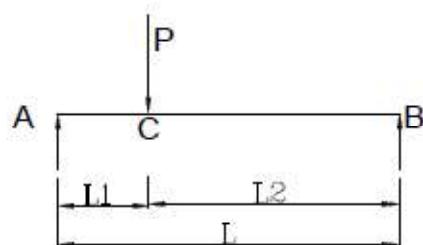
1.



**Answer:**



2.



**Answer :**



**B.4: Draw influence line diagram for force in member 'XY' of the truss shown in the figure below:** [1 x 4 =4]

**Answer:**



### **SECTION - C**

**Full Marks -24**

**C.1: Write short notes (Any Five):**

[5 x 4=20]

**a) Bulking of sand:** Bulking of sand means increase in its volume. Due to presence of moisture a thin film of water around the sand particles is formed. Thickness of water film goes on increasing with more moisture and consequently increases the volume of sand upto a maximum limit & then it reduces to its original volume when it is fully saturated. At that time the bulking is completely nil. The amount of bulking can be readily determined at site with the help of measuring cylinder.

**b) Slump test:** The object of the test is to study the workability of concrete mix. Workability means the ease by which mixing, handling, placing of concrete can be done. Consistency of concrete is obtained through slump test. Concrete is filled in a standard

slump cone of height 300mm, filling the concrete in three layers and each layer compacted with bullet head 16mm dia bar with 25 strokes. Then slump cone carefully lifted. Vertical settlement of the body of concrete is called slump of concrete.

**c) Limitation of Bar Chart:** It does not tell about the details of sub activities. It does not give any clue about the inter-relationship between various activities. It is difficult to read just the length and the position of the bars in case the schedule is changed. It does not show the progress of work.

**d) Gradient:** The slope of the road pavement in the longitudinal direction is called gradient. It may be rise or fall. It is expected as a ratio of rise or fall in a specified horizontal distance. If the slopes of the road 1m rise in 200 horizontal distance it is expressed as 1 in 200 upgrade and similarly the gradient in fall it is expressed as 1 in 200 downgrade.

**e) Construction Joint:** Construction joint is provided where there is break in construction programme. Concreting operation should be so planned that the work is completed in one operation. If however, it has to be stopped before completion of entire work, construction joints are provided. Best locations for construction joints in column – Few cm below its junction with the beam. Beam – Mid span, Slab – Midspan etc.

**f) Hardness in water:** Salts of calcium and magnesium which are dissolved in water during its passage through the ground cause hardness in water. It is two types, “Temporary hardness” and “permanent hardness”. Temporary hardness is removed by boiling but permanent hardness is not removed by boiling. Hard water promotes corrosion, deposition of scales, soap waste in washing and intestinal troubles in human bodies.

**g) Gully Trap:** The primary object of a gully trap is to cut off the house from direct communication with the drain and is an essential part of a house drainage which is provided with a water seal. They are employed for the reception of waste from sick, basin, bathes, rain water, surface water from the paved yards etc. There are two main types of gully traps. Self-cleansing used for foul water and catch pit gullies for retain deposit for surface water or waste water.

**h) Tack coat:** The initial application of binder to an existing surface is given to ensure through bond between the new construction and the existing surface in the bituminous road works. Normally cut back bitumen of 0 or 1 grade or road tar of RT-1 grade is used as tack coat. Before applying tack coat the road surface must be dust free. The quantity of materials depends on the texture of the surface.

**C.2: Write five sentences about current pandemic situation of Covid-19/Amphan. [4]**

A viral disease caused by nCOV-SARS-COV2. First case detected in seafood market in Wuhan city, Hubei, China. First case detected in India on 30<sup>th</sup> January in Kerala. It was declared pandemic on 11<sup>th</sup> March, 2020 by WHO. Clinical features are: Fever, Cough, Sore throat, Breathlessness, Weakness etc. Pandemic situation throughout the world has caused death of more than 1 million people already, many people have lost their livelihood and countries have suffered economic setbacks.

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