

Th-1 ENTREPRENEURSHIP AND MANAGEMENT & SMART TECHNOLOGY

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right-hand margin indicates marks.

1. Answer **All** questions 2 x 10
 - a. Name two barriers in entrepreneurship. 2
 - b. Write two advantages of preliminary project report. 2
 - c. Write two techniques /models of inventory management. 2
 - d. How does branding helps manufacturers, retailer and consumers? 2
 - e. Name two symptoms of bad management. 2
 - f. Write two primary responsibilities of Human Resource Department in an industry. 2
 - g. Write two functions of a leader. 2
 - h. Name four personal protective equipment used in industry. 2
 - i. Write two applications of break-even analysis. 2
 - j. Write two applications of smart agriculture. 2
2. Answer **Any Six** Questions 6 x 5
 - a. Compare between an entrepreneur and manager 5
 - b. Write a short note on a successful Indian Entrepreneur. Mention any five quality in him/her. 5
 - c. Explain the role of District Industry Center in promoting enterprises. List any five supports provided by DIC to entrepreneur. 5
 - d. What are the parameters used to decide the plant capacity in a project? 5
 - e. What is TQM? Explain the need of TQM in small enterprises. 5
 - f. Write any five safety provisions in Factory Act,1948? 5
 - g. Explain the techniques of motivation. 5
3. a. What is Technology Business Incubator? Explain with example. 10
b. Explain the success story of an Indian start up.
4. Explain the components of Techno economic feasibility report. 10
5. Explain delivery schedule, market need and inventory control in production planning and control. 10
6. Write the Concept of IoT and how does it work. 10
7. Explain the management of working capital 10

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Th-2 Structural Design-II

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. What do you mean by efficiency of joint ?
 - b. What is the relation between yield strength and ultimate strength of bolt?
 - c. What is slenderness ratio?
 - d. Define local buckling.
 - e. What is web buckling and web crippling ?
 - f. What is the basic difference between bearing type and HSFG bolts?
 - g. What are the possible failure criteria for tension member?
 - h. Write full form of HFS &ERW ?
 - i. What is radius of gyration?
 - j. What is fillet weld ?
2. Answer **Any Six** Questions 6 x 5
 - a. State all the assumption taken for design of bearing bolts.
 - b. Select a suitable angle section to carry a factored tensile force of 170 KN assuming a single row of M20 bolts and assuming design strength as $F_y=250$ MPa.
 - c. What are the different types of beam sections used in design according to slenderness value?
 - d. What are the types of welds used in steel design explain with neat sketch.
 - e. Determine the plastic moment capacity and plastic section modulus of a symmetrical 'I' section having depth of section as 300mm and width 150mm. Thickness of flange is 14.2 mm and thickness of web is 8.1 mm about z-z axis.
 - f. A butt weld is used to connect two plates of 180mm x 18mm each. Find out the stress developed in the weld if it is subjected to a moment of 13000 KN mm.
 - g. Why tubular sections are preferred over other steel sections?
3. Design a lap joint between two plates each of width 120 mm, if thickness of one plate is 20mm and the other is 11 mm. The joint has to transfer a design load of 240 KN, the plates are of Fe410 grade use bearing type bolts of property class 4.6. 10
4. A tension member consists of a flat 120mm x 8mm is connected to a gusset plate of 12mm thick by 2 numbers of M20 bolts. If steel grade Fe410 and bearing bolts of property class 4.6 are used in field, determine the strength considering all failure criteria . 10
5. Calculate the factored axial load on the column section ISHB 400 @ 806.38 N/M. The height of column is 3.0 m and it is pin ended use steel of Fe410 grade. 10
6. Design a simply supported beam of effective span 1m carrying a factored concentrated load of 360KN at mid span. 10
7. Describe factors affecting the strength of a tubular section. 10

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Th-3 Railway & Bridge Engineering

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2.
Figures in the right hand margin indicate marks.

1. **Answer All questions.** 2 x 10
 - a. Define railway gauge. Name the types of railway gauge used in Indian Railways.
 - b. Define sleepers. Write down the types of sleepers used in railways.
 - c. Define creep of rails. Mention two causes of creep in rails.
 - d. Name the types of gradients provided in railway track.
 - e. What is the need of points and crossings in railway track? Define check rails.
 - f. Define railway yards and classify them.
 - g. Differentiate between bridge and culvert.
 - h. Define afflux and free board in bridges.
 - i. What is cofferdam? Mention its two uses.
 - j. Define wing walls and classify them.
2. **Answer Any Six Questions.** 6 x 5
 - a. Define permanent way. Write down the requirements of ideal permanent way.
 - b. Write down the functions of rails. Briefly explain the types of rail sections used in railway track along with neat sketches.
 - c. Define superelevation. Write down the functions of superelevations in railways.
 - d. Briefly explain the factors responsible for site selection of a railway station.
 - e. Draw the figure showing constituents of a right -hand turn out and label it neatly.
 - f. Write down the site characteristics of an ideal bridge.
 - g. Define caissons .Briefly explain different types of caissons along with their uses.
3. Define ballast. Write down functions and classification of ballast. Also mention the characteristics of good ballast. 10
4. What are the requirements of rail joints ? Discuss different types of rail joints with the help of neat sketches and mention their merits and demerits. 10
5. What are the essentials of track maintenance? Briefly explain the procedure of track maintenance along with its advantages. 10
6. Define piers of bridges and their functions. Draw the cross sectional shapes of piers. Explain different types of piers. 10
7. Define causeway. Explain the necessities and classification of causeways. Mention the conditions to be satisfied for providing causeways. 10

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Th-4 Water Supply & Waste Water Engineering

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. What is per capita demand ?
 - b. Define sewage and sewer.
 - c. What is yield of a well ?
 - d. What is pre-chlorination and post chlorination ?
 - e. Write the short notes on sluice valve and scour valve.
 - f. What is aquifer and their types?
 - g. Write down the PH value of drinking water.
 - h. Write down Darcy's formula for discharge of water.
 - i. Write down the cause of blue baby disease?
 - j. What is flocculation?
2. Answer **Any Six** Questions 6 x 5
 - a. Find the diameter of an open well to give the discharge of 5 lit/sec. The depression head is 5 m and specific yield $2 \text{ m}^3/\text{hr}/\text{m}^2$.
 - b. Describe the biological characteristics of drinking water .
 - c. Write the types of hardness. Write necessity of water softening .
 - d. Describe skimming tank with sketch.
 - e. Write the short notes on 1)Manhole 2)Gully trap.
 - f. Describe the methods of distribution with neat sketch.
 - g. Explain the various methods of sludge disposal.
3. Differentiate between water carriage system and conservancy system of collection of wastes. 10
4. Explain the principle of rapid sand filter. 10
5. The census records of a small town is as follows : 10

YEAR	POPULATION
1940	5,400
1950	6,000
1960	8,000
1970	10,000

Calculate the probable population in 1980,1990,2000,2010 by arithmetic increase method.
6. Write the necessity of secondary treatment of sewage. Sketch the flow diagram of secondary treatment & write the function of each unit. 10
7. Describe the different types of pipes as per material? 10

Th-5 Estimation & Cost Evaluation - II

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1 & 2
Figures in the right hand margin indicates marks

- 1 Answer **All** questions 2 x 10
- a. What is Muster Roll
b. Differentiate between store and stock
c. What do you mean by piece work agreement.
d. What is earnest money.
e. What is drainage syphon
f. Mention the function of coping and kerb in a culvert.
g. Find out weight of a 12 mm dia bar of 1m length.
h. Write down the necessity of providing canal fall.
i. Define lead and lift.
j. What do you mean by Notice Inviting Tender.
- 2 Answer **Any Six** Questions 6 x 5
- a. Calculate the area of the side slopes of portion of a bank for a length of 200 metre. The heights of bank at two ends being 2.50 m and 3.50 m and the ratio of the side slope 2:1. If the side slopes are to be provided with 15 cm thick stone pitching, calculate the cost of pitching at the rate of Rs. 150/- per cum.
- b. Calculate the quantity of main reinforcement required for a slab of 2.1mX 4.8m size provided with 20 mm dia main bars @ 15 cm C/C. In the slab alternate bars bent at 45° with end hooks.
- c. Find out the quantity of earthwork in excavation for drainage syphon from figure 1.
- d. Estimate the quantity of cement concrete work in foundation of a fall from figure 2
- e. What do you mean by administrative approval and technical sanction.
- f. An isolated column footing is of size 2.1 m x 2.1 m and of thickness 650 mm. Find out the volume of cement concrete work for the footing.
- g. Estimate the items involved for construction of a WBM road from the following data:
Length of road = 500 m.
Metalled width = 7 m.
Thickness of brick soiling = 7.5 cm.
Wearing coat of grade-II metal = 12 cm thick loose and 8cm thick compacted surface to be finished with 2 coats of bitumen as given below:
First finishing coat = 12 mm chips @ 0.018 m³/sqm and bitumen @ 1.2 kg per m² of road surface.
Second finishing coat = 6 mm chips @ 0.009 m³/sqm and bitumen @ 1.2 kg per m² of road surface.
Consumption of fuel @ 0.3 kg per kg of bitumen.

3 Prepare a detailed estimate for earthwork for a portion of a road from the following data

10

Formation width of road is 10m, side slope 2:1 in banking and 1½:1 in cutting

Distance in metre	0	100	200	300	400	500	600	700	800	900	1000	1100	1200
R.L of GL	114.5	114.75	115.25	115.20	116.10	116.85	118.00	118.25	118.10	117.80	117.75	117.9	119.5
RL of FL	115 upward gradient 1 in 200							Downward gradient 1 in 400					

4 Write short notes on

10

- Measurement book
- Security money
- Temporary advance
- Acquittance Roll**

5 Estimate the following items involved for septic tank shown in Figure 3

2+4+4

- Earthwork in excavation
- I class brick work in 1:4 cement mortar
- 12 mm thick inside plastering.

6 Estimate the following items of work of a slab culvert from Fig No 4.

5+5

- 1st class brickwork in 1:4 cement mortar
- Cement pointing 1:2

7

- Estimate the quantity of 1st class brickwork in 1:4 cement mortar of a 60 cm fall from Fig No 2
- Estimate the quantity of cement pointing of a drainage syphon from Fig No 1

5+5

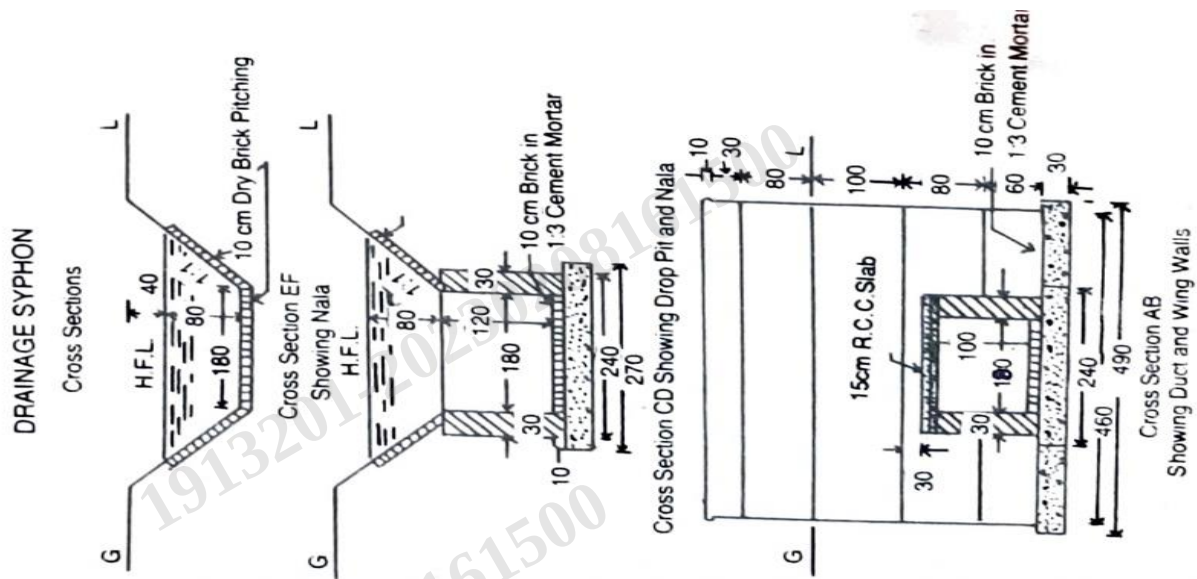


Figure 1

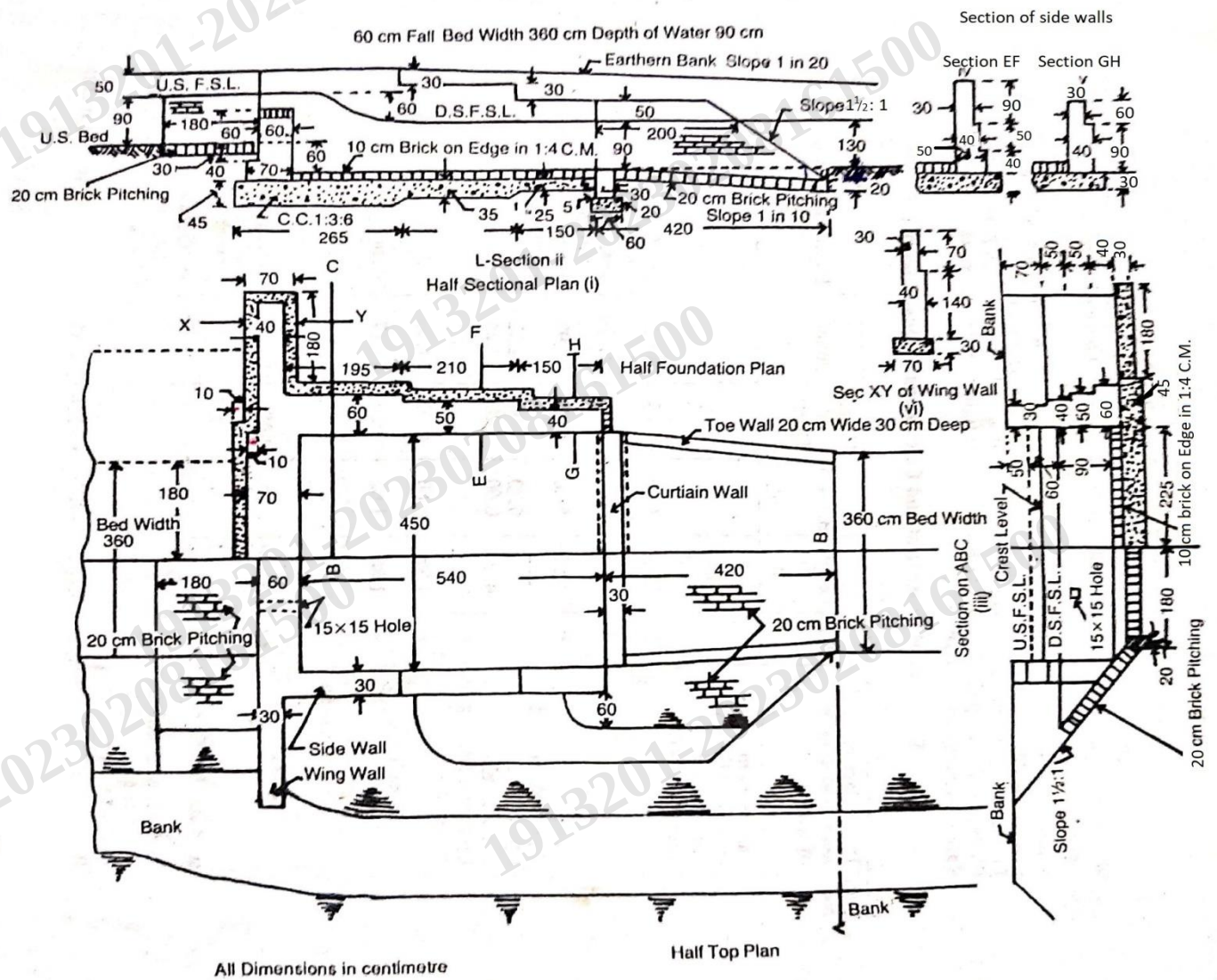


Figure 2

