Bharatiya Vidya Bhavan's

# Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058

## END SEM

## MAY 2018

Program: Civil Engineering

B. Tech.                                                    Duration: 3 hr

Course code:          BTC 428                    Maximum Marks: 100

Name of the Course: Construction Management          Semester: VIII

Instructions:

1. Question no.1 is compulsory and attempt any four out of remaining 6 questions.
2. Neat diagrams must be drawn wherever necessary.
3. Assume Suitable data if necessary and state it clearly

| Question No. | | Maximum Marks | Course Outcome Number | Module No. |
|---|---|---|---|---|
| Q1 (a) | Explain the various phases of qualities throughout the project life cycle. | 5 | CO1 | 6 |
| (b) | What is Contract? Discuss the term Valid, Void and Voidable Contracts with suitable examples. | 5 | CO3 | 7 |
| (c) | Explain in brief with neat sketch working capital cycle. | 5 | CO1 | 5 |
| (d) | Discuss the health and safety planning at pre tender stage. | 5 | CO2 | 3 |
| Q2 (a) | Following is the list of items used in a construction project. Carryout the ABC analysis and categorize them according to their significance. | 10 | CO1 | 5 |

| Items | units | unit price in Rs. |
|---|---|---|
| Brick | 1500 | 1.25 |
| Block | 1000 | 30 |
| drill bit | 3000 | 1.50 |
| Clamp | 1000 | 0.75 |
| Jali | 1600 | 5.5 |
| trap | 1400 | 4.75 |
| W. Sill | 500 | 50 |

| | | | | |
|---|---|---|---|---|
| **(b)** | You are appointed as a project manager in XYZ company. Prepare job layout for the construction of flyover of 1.5 km length. | 6 | CO1 | 5 |
| **(c)** | Highlight the importance of Measurement Book (MB) in the construction project. | 4 | CO1 | 5 |
| **Q3 (a)** | Explain Job analysis and Job description in context of Staffing as managerial function. | 4 | CO1 | 5 |
| **(b)** | What is accident? Suggest the types of personal protective equipments to be used to minimize accidents in construction project. | 6 | CO2 | 6 |
| **(c)** | What are check lists? How it helps in achieving quality at construction site? | 6 | CO2 | 6 |
| **(d)** | Distinguish between<br>(i) Quality control and Quality Assurance<br>(ii) CPM and PERT | 2<br>2 | CO1<br>CO1 | 6<br>3 |
| **Q4 (a)** | Explain the salient features of Arbitration and conciliation Act 1996. | 8 | CO3 | 7 |
| **(b)** | What are different types of hazards in the construction industry? Explain with suitable examples. | 6 | CO2 | 6 |
| **(c)** | Discuss the advantages of Materials Management | 6 | CO1 | 5 |
| **Q5 (a)** | State the advantages and disadvantages of Functional organisation. | 5 | CO1 | 5 |
| **Q5(b)** | Draw WBS for fly over construction. | 6 | CO2 | 6 |
| **(c)** | Differentiate AOA and AON | 5 | CO3 | 5 |
| **(d)** | Explain vertical production scheduling method | 4 | CO1 | 4 |
| **Q6 (a)** | For the following given data, If indirect cost per week is Rs 300/- find the optimal crashed project completion time. | 10 | CO2 | 5 |

| Activity | Immediate Predecessor | Normal time (weeks) | Crash time (weeks) | Normal Cost (Rs) | Crash Cost (Rs) |
|---|---|---|---|---|---|
| A | --- | 8 | 5 | 2000 | 2300 |
| B | --- | 10 | 8 | 4000 | 4300 |
| C | A | 6 | 5 | 3000 | 3125 |
| D | A | 9 | 6 | 5000 | 5225 |
| E | B | 10 | 9 | 2500 | 2700 |
| F | B | 13 | 13 | 5000 | --- |
| G | D,E | 5 | 3 | 1000 | 1700 |

| | | | | |
|---|---|---|---|---|
| **(b)** | Discuss resources leveling and smoothening | 6 | CO3 | 4 |
| **(c)** | Discuss importance of PMC in Mega Project | 4 | CO1 | 1 |
| **Q7 (a)** | Describe the factors to be considered in equipment selection and planning ? | 5 | CO3 | 2 &5 |

| (b) | Elaborate causes of time and cost overruns in Road construction projects. | 5 | CO1 | 6 |
| --- | --- | --- | --- | --- |
| (c) | For the data given find total float, free float, independent float and interfering float for each activity. Determine critical path and its duration. | 10 | CO2 | 3 |

| Activity | Duration (days) | Activity Immediately | |
| --- | --- | --- | --- |
| | | Preceding | Following |
| A | 4 | 1 | 2 |
| B | 12 | 1 | 3 |
| C | 10 | 1 | 4 |
| D | 8 | 2 | 4 |
| E | 6 | 2 | 5 |
| F | 8 | 3 | 6 |
| G | 10 | 4 | 6 |
| H | 10 | 5 | 7 |
| I | 0 | 6 | 7 |
| J | 8 | 6 | 8 |
| K | 10 | 7 | 8 |
| L | 6 | 8 | 9 |

Bharatiya Vidya Bhavan's
# Sardar Patel College of Engineering
(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.
End Semester Exam
May 2018

Max. Marks: 100                                           Duration: 3 Hours
Class: B.Tech.                    Semester: VIII          Program: Civil Engineering
Name of the Course: Earthquake Engineering                Course Code : BTC431
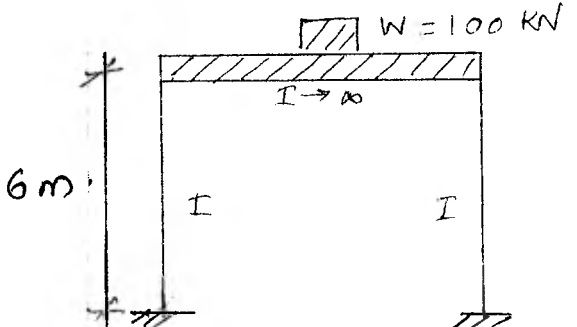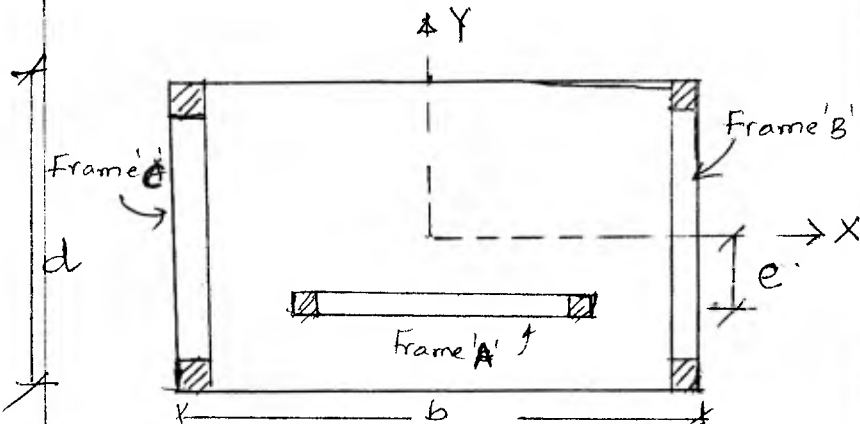
**Instructions:**
- Attempt any FIVE questions out of SEVEN questions.
- Answers to all sub questions should be grouped together.
- Figures to the right indicate full marks.
- Assume suitable data if necessary and state the same clearly.

| Question No | | Max. Marks | Course Outcome No. | Module No. |
|---|---|---|---|---|
| Q1 (a) | Answer the followings:<br>(i) What is dynamic Load? Explain various types of dynamic Loads. | 2 | 1 | 1 |
| | (ii) What is an earthquake? Briefly explain the Plate Tectonic Theory of an earthquake occurrence | 5 | 1 | 4 |
| | (iii) Explain the different types of seismic waves and their characteristics | 3 | 1 | 4 |
| Q1(b) | (i) A single storey structure with rigid slab of total mass 30 t is supported on four corner circular columns of 500 mm dia. as shown in figure. The height of structure is 6.0 m. In general what will be the degrees of freedom for this structure? And specify these dof. Calculate the natural frequency of the structure for excitation in X and Y direction separately. | 5 | 1 | 2,3 |
| | (ii) If the system is subjected to harmonic ground motion of amplitude 0.2g at frequency of 10 rad/sec in X direction only, calculate the maximum lateral displacement of slab and total base shear in X direction $\zeta$ = 5% and E = 20, 000 MPa. Also calculate the maximum stress in each column. | 5 | 1,2 | 2,6 |



Rigid Slab

Column
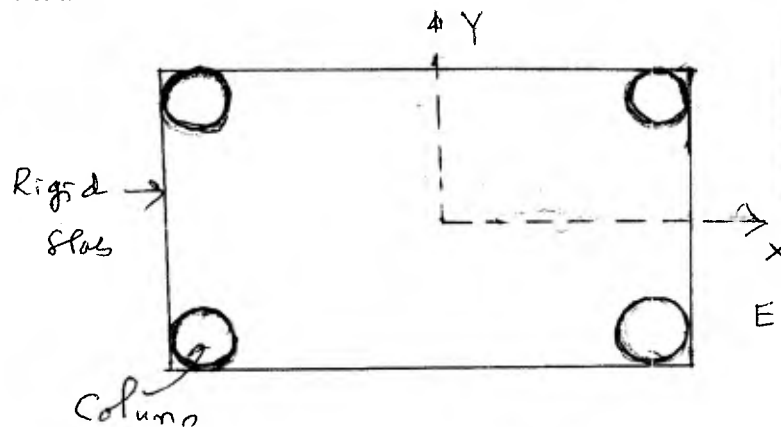
E = 20,000 MPa.

| | | | | |
|---|---|---|---|---|
| **Q2 (a)** | A machine weighing 2500 N is mounted on a supporting system consisting of four springs and four dampers. The vertical deflection of the supporting system under the weight of the machine is measured as 20 mm. The dampers are designed to reduce the amplitude of vertical vibration to one-eighth of the initial amplitude after two complete cycles of free vibrations. Find the following properties of the system:<br>(i) Undamped natural frequency (ii) Damping ratio (iii) Logarithmic decrement ((iv) amplitude after five cycles of free vibrations. | 4 | 1 | 2 |
| | | | | |
| **Q2 (b)** | (i) A one story RCC building is idealized as plane frame with rigid girder as shown in figure. The cross section of columns is 300 mm x 300 mm and E= 20,000 Mpa. If the building is to be designed for ground motion, the response spectrum of which is shown in figure1 but scaled to peak ground acceleration of 0.5g. Determine the design values of lateral deformation and bending moments in the columns | 4 | 2 | 6 |
| | (ii) If the columns of the frame are hinged at base, determine the design values of lateral deformation and bending moments in columns. Comment on the influence of base fixity on the design deformation and bending moments | 4 | 2 | 6 |



| | | | | |
|---|---|---|---|---|
| **Q2 (c)** | A two storey frame with free vibration characteristics as given below is subjected to a harmonic ground motion with amplitude 0.2g and at frequency of **20 rad/sec**. Calculate maximum displacements of each storey. Take damping ratio =5% | 8 | 2 | 6 |

| Floor No. | Mass (t) | Mode No. | $\omega$, rad/sec | Mode Shapes | |
|---|---|---|---|---|---|
| | | | | $\Phi_{i1}$ | $\Phi_{i2}$ |
| 1 | 20 | 1 | 14.58 | 1.0 | 1.481 |
| 2 | 15 | 2 | 38.07 | 1.0 | -0.822 |

| | | | | |
|---|---|---|---|---|
| **Q3** | The plan of one storey building is as shown in figure. The structure consists of a roof idealized as a rigid diaphragm, supported on three frames A, B, and C as shown. The roof weight is uniformly distributed and has magnitude 200 Kg/m². The lateral stiffness are $K_x$= 20000 KN/m for frame A and $K_y$ =25000 KN/m for frames B and C. The plan dimensions are b= 30 m d=20m and e= 4.0m. The height of building is 10m.<br><br>(i) Derive the stiffness matrix and determine the natural frequencies and modes shapes of vibrations of the structure<br><br>(ii) If the structure is subjected to ground motion $\ddot{u}_g(t)$ only in X direction. write down the equations of motion for the system<br><br>(iii) As a special case, if e= 0 calculate the frequencies and mode shapes. And if the system is subjected to the ground motion only in X direction, the response spectrum of which is shown in figure1. Determine the design value of lateral deformation, base shear and bending moment for the system.<br><br> | 20 | 1, 2 | 6 |

| | | | | |
|---|---|---|---|---|
| **Q4 (a)** | What is response spectrum? Explain the procedure to construct elastic response spectrum for estimated peak ground motion parameters | 6 | 2 | 5 |
| **Q4 (b)** | A three story frame has the following free vibration characteristics. The frame is to be designed for the ground motion characterized by the design spectrum given in the figure 1 but scaled to peak ground acceleration of **0.5g**. Calculate the design values of lateral deformation of floors. | 14 | 2 | 6 |

| Story No. | Mass No. | Mass (t) | $\omega$ rad/sec | Mode shapes | | |
|---|---|---|---|---|---|---|
| | | | | $\Phi_{i1}$ | $\Phi_{i2}$ | $\Phi_{i3}$ |
| 1 | 1 | 20 | 15.73 | 0.399 | 0.747 | 1.0 |
| 2 | 2 | 20 | 49.85 | 1.0 | 0.727 | -0.471 |
| 3 | 3 | 20 | 77.82 | -0.908 | 1.0 | -0.192 |

| | | | Marks | CO | BT |
|---|---|---|---|---|---|
| | | | 10 | 1 | 2 |
| Q5(a) | A two storey frame with free vibration characteristics as given below is subjected to a suddenly applied constant force of **50 KN** at 1st floor level and **100 KN** at 2nd floor level. Calculate maximum displacements of each storey. Take damping ratio =5% | | | | |

| Floor No. | Mass (t) | Mode No. | $\omega$, rad/sec | Mode Shapes | |
|---|---|---|---|---|---|
| | | | | $\Phi_{i1}$ | $\Phi_{i2}$ |
| 1 | 20 | 1 | 14.58 | 1.0 | 1.481 |
| 2 | 15 | 2 | 38.07 | 1.0 | -0 822 |

| | | Marks | CO | BT |
|---|---|---|---|---|
| Q5(b) | Explain the important characteristics of Ground Motion | 3 | 2 | 5 |
| Q5(c) | Explain how the magnitude and intensity of an earthquake are measured. | 4 | 2 | 4 |
| Q5(d) | Briefly explain the different types of structural systems used in a building structure to resist lateral loads due earthquake | 3 | 3 | 7 |
| | | | | |
| Q6(a) | State the different methods of seismic analysis as per Is 1893-2016 and also state the limitations of Equivalent Static Method. | 3 | 3 | 7 |
| Q6(b) | Explain the three requirements of displacement design of structure for earthquake load as per IS 1893-2016 | 3 | 3 | 7 |
| Q6(c) | As per IS 1893-2016 how many mode need to be considered in the earthquake force calculation by Response Spectrum Method | 2 | 3 | 7 |
| Q6(d) | Using response spectrum method, calculate the seismic force on each floor of the frame whose pre vibration properties are given below. Use the following additional data: Z=0.24, I =1.5, R=3.0 and $\xi$ = 5%. Assume foundation strata as medium soil and use response spectrum given in figure 2. | 12 | 3 | 7 |

| Story No. | Mass No. | Mass (t) | $\omega$ rad/sec | Mode shapes | | |
|---|---|---|---|---|---|---|
| | | | | $\Phi_{i1}$ | $\Phi_{i2}$ | $\Phi_{i3}$ |
| 1 | 1 | 20 | 15.73 | 0.399 | 0.747 | 1.0 |
| 2 | 2 | 20 | 49.85 | 1.0 | 0.727 | -0.471 |
| 3 | 3 | 20 | 77.82 | -0.908 | 1.0 | -0.192 |

| | | Marks | CO | BT |
|---|---|---|---|---|
| Q7(a) | What is shear (structural) Wall? Explain the advantages of shear (structural) walls. | 2 | 3 | 7 |
| Q7(b) | What is ductility of a structure? Explain the importance of ductility in seismic resistant structures. | 2 | 3 | 7 |

4

| | | 12 | 3 | 7 |
|---|---|---|---|---|
| Q7(c) | Explain the provisions of IS 13920 for (i)Beams: General provisions, longitudinal reinforcement and web reinforcement (ii) Columns: General provisions, longitudinal reinforcement and transverse reinforcement. | 12 | 3 | 7 |
| Q7(d) | Briefly explain the structure of Earth | 4 | 1 | 4 |
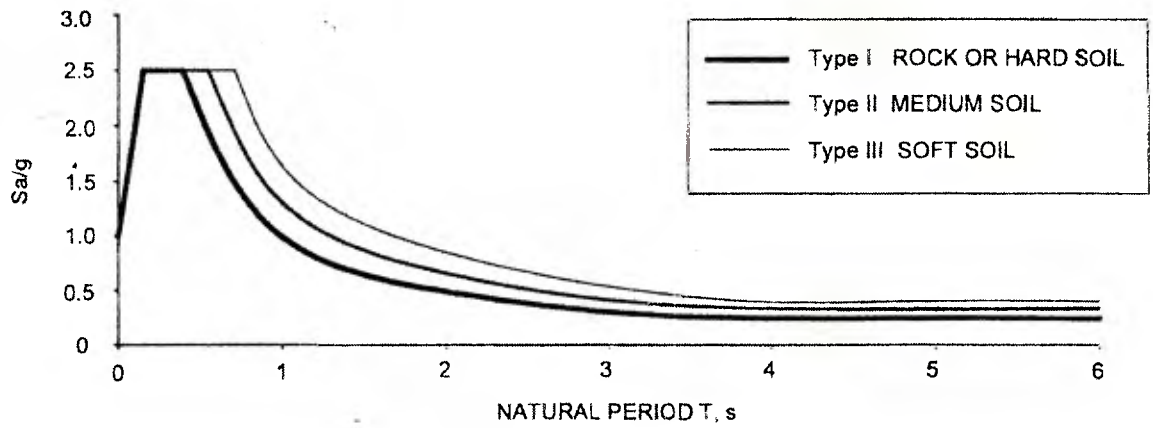


2B SPECTRA FOR RESPONSE SPECTRUM METHOD

FIG. 2 DESIGN ACCELERATION COEFFICIENT ($S_a/g$) (CORRESPONDING TO 5 PERCENT DAMPING)

# DISPLACEMENT RESPONSE SPECTRA
## FOR EL-CENTRO EARTHQUAKE FOR 5% DAMPING $PGA = 0.32g$

DISPLACEMENT IN METERS
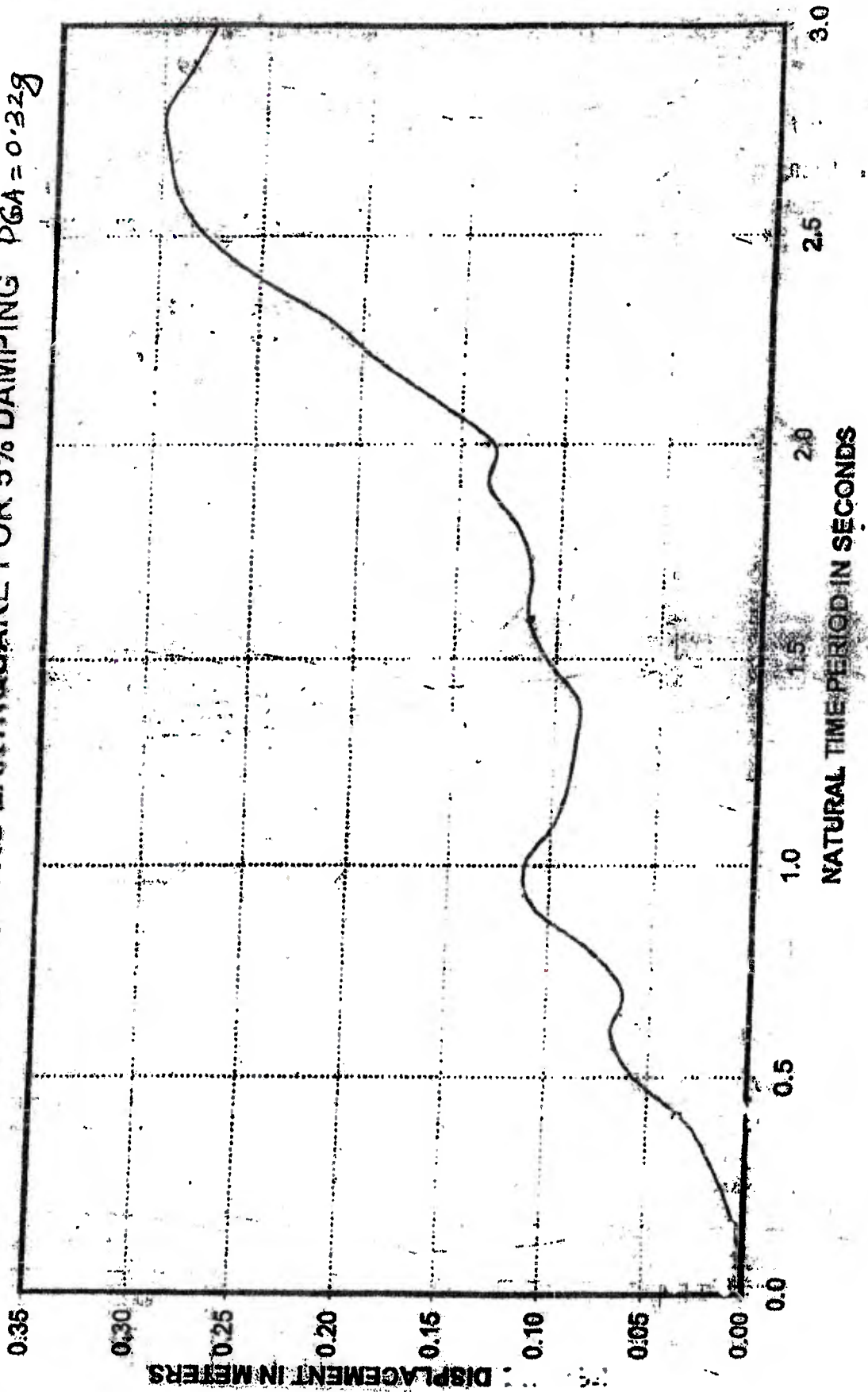
NATURAL TIME PERIOD IN SECONDS

Figure 1

9

Bharatiya Vidya Bhavan's

# Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam

May 2018

Max. Marks: 100            Duration: 3 Hrs

Class:.B.Tech     Semester: VIII     Program: Civil Engineering

Name of the Course:    Appraisal & Implementation of Infrastructure projects

Course Code : BTC438

**Instructions:**

1. **Attempt any five out of Seven questions.**
2. **Make suitable assumptions where necessary and state them clearly.**

| Question No | | Maximum Marks | Course Outcome Number | Module Number |
|---|---|---|---|---|
| Q1 | A) What do you mean by Project Appraisal? Explain necessity of project appraisal. Also explain difference between appraisal & feasibility study. | 10 | 1 | 01 |
| | B) What are the key issues should be addressed while appraising projects? | 10 | | 01 |
| Q2 | A) Explain the following terms, <br> 1) Project management cycle <br> 2) BOT/BOOT/BOO/BOLT | 08 | 2 | 02 |
| | B) Explain necessity & components of SWOT analysis in Appraisal & Implementation of Infrastructure projects. | 06 | 2 | 02 |
| | C) Find B.E.P (in terms of no of units) & how much units should be produced for getting Rs. 30000/- As Profit for give data. Total cost= 90000/-. Fixed cost= 34000/-. Sales(7000 units)=70,000/- | 06 | 3 | 04 |
| Q3 | A) Explain commercial/Market appraisal in detail & also explain various methods required to be carried out for market appraisal. | 08 | 2 | 03 |
| | B) Write a short note on project audit report & its phases | 06 | 2 | 05 |
| | C) Explain the difference between economic appraisal & financial appraisal. | 06 | 3 | 04 |
| Q4 | A) Explain a Strategic implementation plan & process. Also explain a project implementation plan, its components and Best practices for implementation planning. | 10 | 4 | 02 |
| | B) Explain all components which are required to be carried out while preparing project | 10 | 3 | 07 |

| | | | | | |
|---|---|---|---|---|---|
| | appraisal report. | | | | |

| | | | | |
|---|---|---|---|---|
| | A) Compare the difference between NPV & IRR method. Calculate the internal rate of return for given data, | 06 | 3,4 | 04 |

| Year | Cash Outflow (in Lakh) | Cash Inflow (in Lakh) |
|---|---|---|
| 0 | 12.0 | |
| 1 | - | 4.5 |
| 2 | - | 2.5 |
| 3 | - | 2.25 |
| 4 | - | 2.0 |
| 5 | - | 1.5 |
| 6 | - | 1.0 |

| | | | |
|---|---|---|---|
| B) What are the financial instruments available for funding/financing infrastructure projects in worldwide? | 08 | 3 | 06 |

**Q.5.**

C) There are three projects A,B, and C. The details about three projects are tabulated below. Compare the three projects by ARR method & choose the best one.

| | Profit after Tax | | |
|---|---|---|---|
| | A (in Lakh) | B (in Lakh) | C (in Lakh) |
| Life of the project | 4 | 5 | 6 |
| I YEAR | 4.5 | 3.5 | 3.0 |
| II YEAR | 5.0 | 5.0 | 3.5 |
| III YEAR | 5.5 | 5.5 | 4.0 |
| IV YEAR | 6.0 | 6.0 | 4.5 |
| V YEAR | | 5.5 | 4.0 |
| VI YEAR | | | 3.5 |

| | Book Value of Investment | | |
|---|---|---|---|
| | A (in Lakh) | B (in Lakh) | C (in Lakh) |
| I YEAR | 14.0 | 12.50 | 10.50 |
| II YEAR | 13.5 | 10.80 | 9.0 |
| III YEAR | 12.24 | 9.45 | 8.50 |
| IV YEAR | 10.0 | 8.42 | 7.65 |
| V YEAR | | 7.35 | 6.40 |
| VI YEAR | | | 5.40 |

(06 | 3,4 | 04)

| | | | | | | |
|---|---|---|---|---|---|---|
| | A) Find nominal rate of return & real rate of return for the data given in Q.6 (A). Assume a rate of inflation of 10% on cash inflow. | | | 06 | 3,4 | 05 |
| | B) Explain the difference between Discounted & Non discounted cash flow techniques. Also write down all techniques available for financial appraisal with their advantages & Disadvantages. | | | 08 | 3,4 | 05 |
| Q.6. | C) Compare project A & B using given tabulated data by NPV Method. Assume cash inflow & investment on the projects in made at the beginning of the first year. | | | 06 | 3,4 | 05 |

C) table:

| | A | B |
|---|---|---|
| Investment | 12,00,000/- | 12,00,000/- |
| Life (years) | 5 | 5 |
| Implementation period | 1 | 1 |
| Cost of Capital | 15% | 13% |
| Year | | |
| 1 | 2.0 Lakh | 3.0 Lakh |
| 2 | 2.5 Lakh | 4.0 Lakh |
| 3 | 3.5 Lakh | 4.0 Lakh |
| 4 | 3.0 Lakh | 3.5 Lakh |
| 5 | 1.0 Lakh | 2.0 Lakh |

| | | | | |
|---|---|---|---|---|
| Q.7 | For the set of data given below, general inflation rate arrive at sales revenue is 9% and for operating cost is 10%. Find nominal rate of return & real rate of return for given data. | 08 | 3,4 | 05 |

| Year | Cash outflow (in Lakh) | Sales revenue (in Lakh) | Operating cost (in Lakh) |
|---|---|---|---|
| 0 | 10.0 | - | - |
| 1 | - | 8.0 | 2.5 |
| 2 | - | 8.5 | 3.0 |
| 3 | - | 9.0 | 4.50 |
| 4 | - | 9.5 | 5.50 |
| 5 | - | 9.5 | 6.5 |
| 6 | - | 9.5 | 7.5 |

| | | | | |
|---|---|---|---|---|
| | A company has an investing surplus of 50.0 Lakh. There are six project identified by company that are considered good for investment. The capital outlay & NPV are tabulated below. Find the optimum combination of projects to satisfy the budget of 50.0 Lakh | 12 | 3,4 | 05 |

| Project | Initial Capital outlay (in Lakh) | NPV (in Lakh) |
|---|---|---|
| A | 22.0 | 70.0 |
| B | 17.0 | 58.0 |
| C | 13.0 | 35.0 |
| D | 8.0 | 28.0 |
| E | 4.0 | 20.0 |
| F | 2.0 | 9.0 |

Bharatiya Vidya Bhavan's

# Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

Re-Examination

June 2018

Q. P. Code:

Max. Marks:**200**

Duration: **2** Hrs.

Class: B.Tech (Civil)    Semester: VIII

Program: Civil Engineering

Name of the Course: Entrepreneurship & Management.

Course Code : BTC446

**Instructions:**

- Attempt all questions.

| Question No | | Maximum Marks | Course Outcome | Module no |
|---|---|---|---|---|
| Q.1 | Explain the concept of Entrepreneur and Entrepreneurship with one example.<br>b) What are the different factors affecting to entrepreneurship process? | 20 | 1-3 | 1 |
| Q.2 | a) Discuss the various classification/types of entrepreneurs along with one example.<br>b) Explain the Maslows theory for motivation. | 20 | 1,2 | 1 |
| Q.3 | a) Describe contribution made by "Fredrick Taylor" towards scientific management?<br>b) Describe contribution made by "Melto" towards management? | 20 | 1,2 | 1 |
| Q.4. | a) What do you mean by the Project? Explain project formulation?<br>b) What are different sources & types of finance available for entrepreneurship in India? | 20 | 1,2 | 2 |
| Q.5. | a) Define the small scale industry and also Highlight the chief characteristics of it.<br>b) Explain in detail various steps to be followed in start up the small scale industry. | 20 | 1,2 | 3 |
| | a) Write short note on: Break Even analysis.<br>b) An initial investment in plant & machinery of ₹ 10000 is expected to generate cash flows of ₹ 1342, ₹ 1200, ₹ 1850, ₹ 3230 at the end of first, second, third & fourth year respectively. At the enfd of fourth year machines will be sold for ₹ 950 as salvage value. Calculate the net present value of the investment if the discount rate is | | | |

11%.

c) Journalize the following transactions in the books of Mr. Aakash for Dec 2014 & also post them in ledger for cash account only.

| Date | Transactions | Amount | | | |
|------|-------------|--------|---|---|---|
| 1 | He started the business with cash | 200000 | 4+6+10 | 1,2 | 3 |
| 3 | Sold goods to Mr.Amitr for cash | 800 | | | |
| 8 | Purchased goods on credit from rakesh. | 4000 | | | |
| 10 | Paid office rent by cheque of Bank of Baroda | 1500 | | | |
| 12 | Paid commission to RaKESH | 6000 | | | |
| 16 | Purchased furniture from SHAH furniture Mart | 17000 | | | |
| 19 | Deposited money in bank of MAHARASHTRA | 1000 | | | |
| 24 | Returned goods to Mr.Nagesh | 2000 | | | |
| 26 | Received interest | 15000 | | | |

Q.7 Write short notes on: - (any four)

  I.    SWOT analysis.
  ii.   Environment for Entrepreneurship.
  iii.  Break-Even analysis
  iv.   Barriers affecting to Entrepreneurship.          20          1,2          3
  v.    Importance of Small Scale Industries in India.
  vi.   Line & line-staff Organisation.

*Given Sem*    REEXAM

*June 2018*

Max. Marks: 100

Duration: 4 hr

Class: B.Tech Civil

Name of the course: Design and Drawing of RC structures.

Q.P. Code: BTC 426

Course Code : BTC 426

Sem-VIII

Program: Civil Engineering

**Instructions:**
1) Attempt five of the following.
2) Use of IS 456:2000 is permitted.
3) Figures to right indicate full marks.
4) Assume suitable data if necessary and state the same clearly.

| Question No | | Maximum Marks | Course Outcome Number | Module Number |
|---|---|---|---|---|
| Q1 | A reinforced cantilever RW is supporting backfill of height 4.5 m above ground level with density of soil =17 kN/m³,Angle of repose=30°,S.B.C of soil=150 kN/m² and coefficient of friction between concrete and soil =0.5.Design the **Stem and toe** of the wall only showing all stability checks. Draw reinforcement details also. Use M30 & Fe 415. | 20 | 1,2,3,4 | 5 |
| Q2 | The staircase room for a four storeyed framed structureof a residential building is of size 3.9m X 5.3m between centre of columns. The columns are of size 250 mm x 250mm.The width of beam and supporting wall is 230 mm. The floor to floor height is 3.2 m .Use M-25,Fe-415.Design a suitable dog-legged stairs and draw details of reinforcement for **both the flights.** | 20 | 1,2,3,4 | 1 |
| Q3 | The layout of the columns of the building is shown in figure 1.The outer column are 300x300mm in size and carry load of 1000kN each. The inner column are 500x500mm in size and carry a load of 1400kN each. Consider SBC of soil as 150kN/m².Use M20 and Fe-415 Design only **main beam** of the raft foundation. Show reinforcement details also. | 20 | 1,2,3,4 | 2 |
| Q4 | Design rectangular water tank open at top resting on ground having size of 5.0mx8mx4m high. Adopt M30 and Fe-415.Using **approximate method** design **walls** of the tank. Draw plan and section with proper reinforcement details. $\sigma_{ct}$ =1.5N/mm2 and $\sigma_{st}$=130N/mm2. | 20 | 1,2,3,4 | 6 |

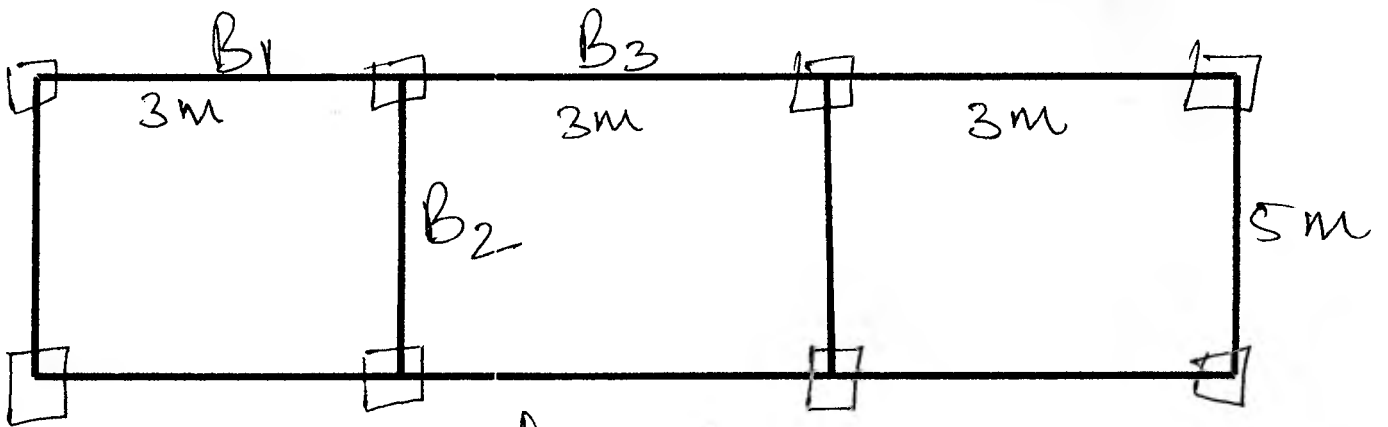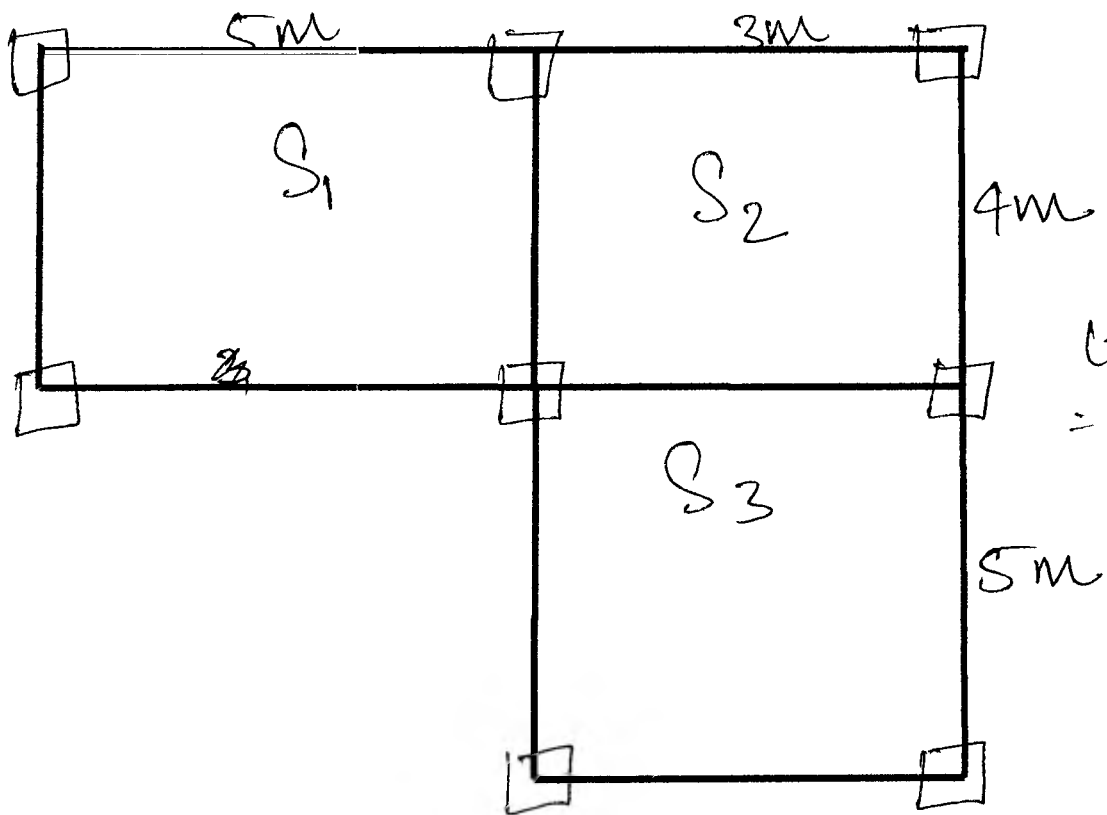| Q5 | Design circular tank using **approximate method** with fixed base resting on ground and free at top for capacity of 700m³.Height of tank is restricted to 5m.Use M-30 and Fe-415. Draw reinforcement details. $\sigma_{ct}$ =1.5N/mm2 and $\sigma_{st}$=130N/mm2. | 20 | 1,2,3,4 | 7 |
|----|---|---|---|---|
| Q6 | For the floor system shown in figure 1,design beam B1-B2-B3.Take live load =3kN/m².Floor to floor height as 3.5m,wall thickness =230mm.Take full wall height on B1 ,B2,B3.Use M30 and Fe-415.Draw reinforcement details. | 20 | 1,2,3,4 | 3 |
| Q7 | For the floor system shown in figure 2,design slab S1,S2,S3. Take live load =3kN/m². Use M30 and Fe-500.Draw reinforcement details. | 20 | 1,2,3,4 | 4 |



fig 1



col sizes
= (450 X 450)

Q. P. Code:

Max. Marks: 100                                     Duration: 4 hour

Class: B.Tech.          Semester: VIII          Program: Civil

Name of the Course: Quantity Surveying Estimation and Valuation

Course Code : BTC- 427

**Instructions:**

1.  Question No 1 is compulsory.
2.  Attempt any four questions out of remaining six.
3.  Draw neat diagrams wherever required
4.  Assume suitable data if necessary

| | Question No. 1 | Maxi mum Marks | C.O. | Mod. |
|---|---|---|---|---|
| Q1 | Workout the quantities of below mentioned items of work from given plan and section provided in Figure 1. | | | |
| | (a) Plain cement concrete in foundation | 05 | C.O.1 | 01 |
| | (b) 1ˢᵗ Class Brickwork in cement mortar 1:3 in foundation up to plinth | 05 | C.O.1 | 01 |
| | (c) External plastering 25 mm thick in C.M (1:4) (excluding chajja and plinth steps) | 05 | C.O.1 | 01 |
| | (d) Prepare an abstract of cost for the items (a) and (b). | 05 | C.O.1 | 01 |
| Q2 | (a) Draft a tender notice for construction of hospital building by CIDCO, Navi Mumbai (Executive Engg) with an estimated cost of Rs 50 crores and duration of project is 36 months. | 06 | C.O.3 | 6 |
| | (b) What is an unbalanced tender? Explain with suitable example. | 06 | C.O.3 | 6 |
| | (c) Perform rate analysis for internal plastering in cement mortar 1:4 including scaffolding. | 08 | C.O.2 | 5 |
| Q3 | (a) Prepare approximate estimate for G+1 R.C.C framed row house, having total carpet area of 90 sq m, in semi urban area. Assume cost of construction of superstructure as Rs 7,500/- per sq m. Assume area occupied by walls and columns etc as 10% of built up area and area of circulation as 15% of built up area. | 07 | C.O.1 | 3 |
| | (b) Write detailed specification for brick masonry in C.M (1:4) in superstructure. | 07 | C.O.2 | 4 |
| | (c) Explain Belting Method of valuation with neat diagram. | 06 | C.O.4 | 7 |

| | | | | |
|---|---|---|---|---|
| **Q4** | **(a)** Specify the rules for deduction for openings as per IS 1200 for items of work as brick masonry wall. | 05 | C.O.1 | 2 |
| | **(b)** Explain Prequalification of contractor and pre bid conference | 05 | C.O. 3 | 6 |
| | **(c)** A person has purchased an old building in vacant possession on a land measuring 170 sq m having total plinth area 110 sq m for an amount of Rs 11,00,000. From records, it is found out that the present age of the building is 45 years. The total life of old building was 90 years. If the present value of land is Rs 3200 per sq m and present plinth area rate to construct such building considering point obsolescence be Rs 9,000/- per sq m including the cost of all services. Work out your valuation to compare the above purchase value with the above data. Consider sinking fund at 6 percent per annum. | 10 | C.O.4 | 7 |

| | | | | |
|---|---|---|---|---|
| **Q5** | **(a)** A simply supported RCC slab of 3.05m X 5.0m and 15 cm thick is shown in Figure 2. Assuming a cover of 25 mm on all the sides, calculate the total quantity of steel required and draw the bar bending schedule. Following details are given:<br>i) Bar a-a : 16 mm diameter, straight bars at 30 cm c/c, 17 nos.<br>ii) Bar b-b : 16 mm diameter, 30° bent up bars at 30 cm c/c, 17 nos.<br>iii) Bar c-c : 12 mm diameter, straight bars at 20 cm c/c, 16 nos<br>iv) Bar d-d : 10 mm diameter, holding bars, 4 nos. | 10 | C.O.1 | 2 |
| | **(b)** Differentiate between the following<br>i) Economic haul distance and free haul distance | 03 | C.O.1 | 2 |
| | ii) Straight line method and Sinking fund method of depreciation | 03 | C.O.4 | 7 |
| | **(c)** What do you mean by Liquidated damages? | 04 | C.O. 3 | 6 |

| | | | | |
|---|---|---|---|---|
| **Q6** | **(a)** Work out the Earthwork quantities in embankment and cutting for the chainage length of 600 mtrs.<br>The particulars are:<br>Formation width = 20mts. Side slopes:= in embankment:= 2:1 (H:V) &<br>in cutting : = 1.5:1 ((H:V), There is no transverse slope.<br>Rising gradient of 1 : 250, up to 250 mt chainage and Rising gradient of 1 : 100 up to 600 mt chainage. | 10 | C.O.1 | 1 |

| Chainage (m) | 0 | 50 | 100 | 150 | 200 | 250 | 300 |
|---|---|---|---|---|---|---|---|
| RL of Ground (m) | 152.0 | 152.35 | 152.6 | 152.80 | 153.0 | 152.65 | 152.2 |
| RL of Formation (m) | | 151.6 | | | | | |
| Chainage | 350 | 400 | 450 | 500 | 550 | 600 | |
| RL of Ground (m) | 151.50 | 151.20 | 150.55 | 150.35 | 150.50 | 150.75 | |
| RL of Formation (m) | | | | | 155.40 | | |

| | | | | |
|---|---|---|---|---|
| | **b)** Enumerate different Civil construction project contracts types. What are the essentials requirements of a valid contract? Differentiate between void and voidable contract. | 10 | C.O.3 | 6 |

| | | | | |
|---|---|---|---|---|
| **Q7** | **Write short notes on the following :** | | | |
| | i. Extra Item and Price Variation | 05 | C.O.3 | 6 |
| | ii. Mass haul diagram. | 05 | C.O.1 | 2 |
| | iii. Settlement of disputes | 05 | C.O.3 | 6 |
| | iv. Principles of writing specifications | 05 | C.O.2 | 4 |

Figure 1

All dimensions are in mm

| | |
|---|---|
| All walls | 30 mm thick |
| Slab thickness | 120 mm |
| Chajja | 80 mm thick |
| Chajja projection | 500 mm |
| Slab projection | 50 mm |
| Band Lintel | 150 mm thick |
| Lintel level | 2100 mm |
| Floor to ceiling ht. | 2.9 m |
| Doors : D | 1200 × 2100 |
| $D_1$ | 1000 × 2100 |
| $D_2$ | 900 × 2100 |
| Windows : $W_1$ | 2000 × 1300 |
| $W_2$ | 1500 × 800 |
| V | 600 × 400 |
| Opening  O | 1000 × 2100 |

LIVING ROOM (4000 × 5600)

W.C. (1200 × 1500)

BATH (1300 × 1800)

KITCHEN (2500 × 3100)

BEDROOM (5500 × 3200)



Figure 2

Section

Plan

a–a
a–b
a–a
b–b
c–c
d–d
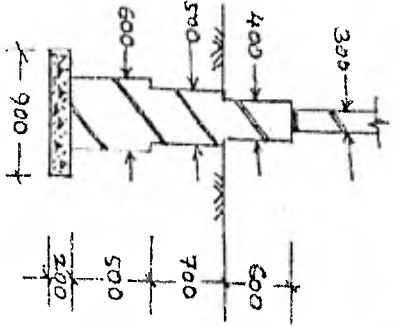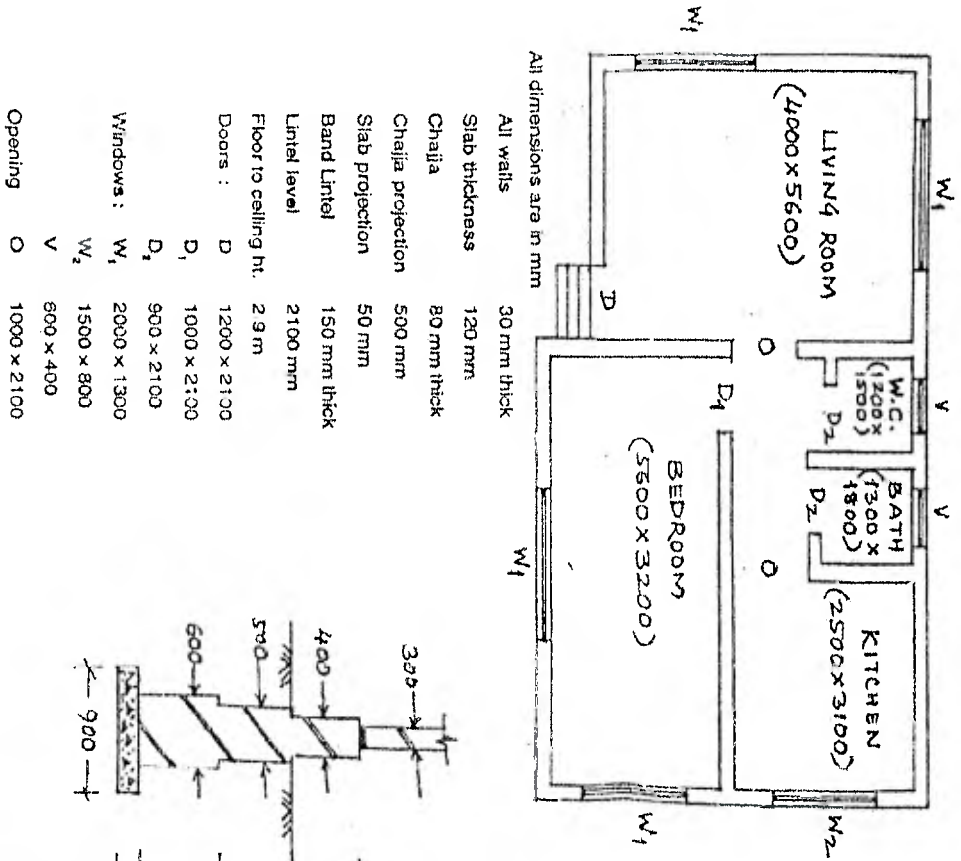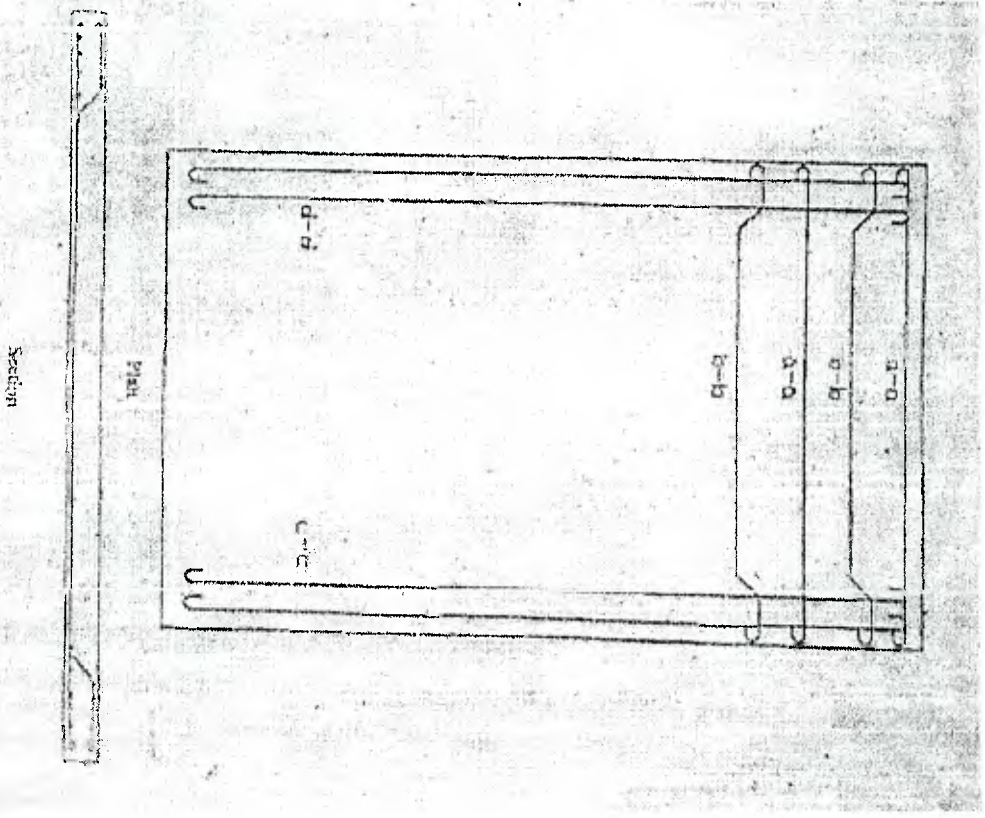
Bhartiya Vidya Bhavan's
**Sardar Patel College of Engineering**
(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.
ESE EXAM-MAY 2018

Max. Marks: 100
Class: B.Tech      Semester: VIII

Q. P. Code:
Duration: 3 Hrs
Program: Civil Engineering

Name of the Course: Entrepreneurship & Management
Course Code : BTC446

**Instructions:**
1. **Question no 1 is compulsory & attempt any four out of remaining six questions.**
2. **Make suitable assumptions where necessary and state them clearly.**

| Question No | | Maximum Marks | Course Outcome Number | Module no. |
|---|---|---|---|---|
| Q1 | **Write short notes on: - (any four)**<br>1. Entrepreneurial Culture<br>2. SWOT Analysis<br>3. Social Cost benefit analysis<br>4. Types of ownerships with one example<br>5. Basic functions of management | 20 | 1,2,3 | 1-7 |
| Q2 | A) Explain the concept of Entrepreneur & Entrepreneurship with suitable example. What is the ideal environment required for development of entrepreneurship process. | 10 | 1,2 | 1 |
| | B) What are the different kinds of characteristics should possess by entrepreneur? **(Any ten)** | 10 | 1,2 | 1 |
| Q3 | A) Discuss the Barriers affecting the Entrepreneurship Process. **(ANY FIVE)** | 05 | 1,2 | 2 |
| | B) Discuss the various classification/types of entrepreneurs along with one example. | 10 | 1,2 | 3 |
| | C) Write a short note on: Entrepreneurial Motivation | 05 | 1,2 | 3 |
| Q4 | A) Discuss the Maslow's Need for hierarchy Theory of Motivation. Also explain how to incorporate its principles in regular business. | 10 | 1,2 | 3 |
| | B) Explain the following points which are related to formulation of project,<br>• Various stages of project<br>• Project development cycle<br>• Project Appraisal<br>• Project report | 10 | 3 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| **Q.5.** | A) Explain any four sources & types of finance available for an industry in India. | 04 | 3 | | 5 |
| | B) Define the small scale industry and also highlight the chief characteristics of it in the context of developing country. | 08 | 3 | | 5 |
| | C) Explain the different types or forms of organizations with their advantages & disadvantages. | 08 | 3 | | 5 |
| **Q.6.** | A) Write a short note on following tools of analysis:<br>• Payback period.<br>• Break-even analysis. | 06 | 3 | | 4 |
| | B) An initial investment in plant & machinery of ₹ 19000 is expected to generate cash flows of ₹3342, ₹3700, ₹5850, ₹ 7230 at the end of first, second, third & fourth year respectively. At the end of fourth year machines will be sold for ₹ 800 as salvage value. Calculate the net present value of the investment if the discount rate is 11%. | 04 | 3 | | 4 |
| | C) Journalize the following transactions in the books of Mr. Ram Mahajan for Oct 2017 & also post them in ledger. | 10 | 3 | | 6 |
| **Q.7** | A) "Hardly a competent workman can be found who does not devote considerable amount of time to studying just how slowly he can work & still convince his employer that he is going at good pace" Discuss the Fredrick Taylor's above quote with his all principles of management. | 10 | 3 | | 7 |
| | B) Describe the contribution made by "Henry Fayol" towards Administrative approach management. | 10 | 3 | | 7 |

Q.6. C) table of transactions:

| Date | Transactions | Amount |
|---|---|---|
| 1 | He started the business with cash | 250000 |
| 3 | Received interest | 1700 |
| 8 | Purchased goods on credit from Aakash. | 24000 |
| 10 | Paid office rent by cheque of Bank of India | 3900 |
| 12 | Paid commission to kumar | 1600 |
| 16 | Deposited money in bank of Baroda | 25000 |
| 19 | Sold goods to Mr. Raj for cash | 8500 |
| 24 | Returned goods to Mr.Narayan | 2000 |
| 26 | Purchased furniture from Rafique furniture Mart | 16000 |

Q. P. Code:

Duration: 4 hour

Max. Marks: 100

Program: Civil

Class: B.Tech.          Semester:  VIII

Name of the Course: Quantity Surveying Estimation and Valuation

Course Code : BTC- 427

**Instructions:**
1.  Question No 1 is compulsory.
2.  Attempt any four questions out of remaining six.
3.  Draw neat diagrams wherever required
4.  Assume suitable data if necessary

| | Question No. 1 | Maximum Marks | C.O. | Mod. |
|---|---|---|---|---|
| Q1 | Figure 1 and 2 shows the plan and sectional details of a load bearing residential structure. | 05 | C.O.1 | 01 |
| | (a) Draw the excavation plan | 05 | C.O.1 | 01 |
| | (b) calculate 1st Class Brickwork in foundation up to plinth | | | |
| | (c) Determine the quantity of Internal plaster, 12 mm thick in C.M (1:4) for inside walls only. | 05 | C.O.1 | 01 |
| | (d) Flooring in 1:6 cement mortar using mosaic tiles. | 05 | C.O.1 | 01 |
| Q2 | (a) Draft a tender notice for construction of a skywalk in suburban Mumbai, estimated cost of Rs. 25 crores and is to be completed in 15 months. | 06 | C.O.3 | 6 |
| | (b) What is mean by termination of contract? Explain in detail. | 06 | C.O.3 | 6 |
| | (c) Perform rate analysis for M-25 Grade of concrete with 1.5 % steel. | 08 | C.O.2 | 5 |
| Q3 | (a)  Prepare an approximate estimate for a residential building in western suburbs of Mumbai (RCC framed structure) from following details: <br>(i) Plot size – (60 m x 30 m), (ii) FSI- 1.5  (ii) Building is G+3 <br>(iv) Consider foundation cost as 20% of superstructure cost <br>(v) allow 20% of building cost for all services (vi) allow 2.5% of overall  cost for consultant fees <br>(vii) Consider 5% provision for contingencies. | 07 | C.O.1 | 3 |
| | (b) Write detailed specification for external plaster in two coats (20 mm thick) with C.M (1:4) in superstructure. | 07 | C.O.2 | 4 |
| | (c) A concrete mixer was purchased for Rs. 60 lakhs. Assuming a salvage value of Rs. 5 lakhs at the end of 11 years. Calculate the book value and depreciation at the end of the first five years by constant percentage method. | 06 | C.O.4 | 7 |

| Q4 | (a) Specify the rules for deduction for openings as per IS 1200 for items of work as external plaster. | 05 | C.O.1 | 2 |
|---|---|---|---|---|
| | (b) Explain different types of tender. | 05 | C.O. 3 | 6 |
| | (c) The annual rent received from a property of Rs. 1, 20,000. The future life of the building in current condition is estimated to be 8 years. However, if certain structural improvements and repairs are carried out at an estimated cost of Rs. 2.5 lakh, then the estimated life of the structure will increase to 25 years. Assuming rate of interest in scheduled bank as 9 % and sinking fund accumulated at 4% interest, determine if repairs are recommended. | 10 | C.O.4 | 7 |
| Q5 | (a) Prepare a bar bending schedule for the R.C.C. retaining wall which is 50 m long as shown in figure 3.. | 10 | C.O.1 | 2 |
| | (b) Draft contract condition for (i) Time is an essence (ii) Liquidated damages for delay. | 07 | C.O. 3 | 6 |
| | (c) Explain clearly the difference between cost, price and value. | 03 | C.O.1 | 7 |
| Q6 | (a) Calculate the volume of earthwork for a proposed road with the following details. | 10 | C.O.1 | 1 |

| Chainage | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|
| RL of Ground (m) | 88.1 | 87.75 | 87.9 | 89.2 | 90.8 | 91.3 | 88.5 |

Assuming a formation width of 10 m and Side slopes in embankment:= 2:1 (H:V) & in cutting 1:1 ((H:V). The road formation is proposed at a uniform raising gradient of 1 in 100 from chainage 10 and its level is 88.5 m (length of chain is 20 m).

| | b) State the various types of contract. Explain target contract, joint venture and turnkey contract in detail. | 10 | C.O.3 | 6 |
|---|---|---|---|---|

| Q7 | Write short notes on the following : | | | |
|---|---|---|---|---|
| | i. Earnest money and Security deposit | 05 | C.O.3 | 6 |
| | ii. Freehold and leasehold property. | 05 | C.O.1 | 2 |
| | iii. Advantages of arbitration | 05 | C.O.3 | 6 |
| | iv. Role and importance of a quantity surveyor in a civil Engineering Project | 05 | C.O.2 | 4 |

**Figure 1**

Bedroom 2
4 m × 4.5 m

Open
Verandah
2 m × 4.5 m

Bath
2 m × 1.5 m

WC    D2

Kitchen
3 m × 3 m

WC. and Bath
4 m × 2 m

Living Room
6 m × 4.5 m

Dining
5 m × 3 m
Open

Bedroom 1
4 m × 5 m

D: 1.2 m × 2.1 m
D2: 0.8 m × 2.1 m
W: 1.5 m × 1.5 m
V: 0.6 m × 0.8 m
Open: 4 m × 2.1 m
WC: 1.5 m × 1 m

**Figure 2**

Section A-A'

10 cm thick RCC slab

Mosaic tile flooring
5 cm PCC
10 cm thick
cement concrete

45 cm thick
sand filling

PCC (1:4:8)

1.00
0.20
0.15
0.10
3.00
2.10
0.20
0.60
0.20
0.50
0.50
0.50
0.30
0.40
0.50
0.30

**Figure 3**