

Q.P. Code: 25843

(3 hours)

[Total Marks-80]

- N.B. (1) Attempt any four questions out of six questions
 (2) Assume any additional data if necessary and state it clearly
 (3) Figures to the right indicate full marks

- 1 a) Trains X and Y arrive at a station at random between 9 am and 9.30 am. Train X stops for 5 minutes and Train Y stops for 4 minutes. Assuming that both trains arrive independently of each other, what is the probability that [06]
 i. Train X arrives before Train Y
 ii. The trains meet at the station
 iii. Assuming that the trains meet, Train X arrived before Train Y
 b) Based on a 360° appraisal, a project manager's performance was evaluated based on ranks obtained for some parameters, on his previous project as given in Table below. [06]
 The ranks were given from 1 to 8

Peer Review and Self-appraisal on previous projects

Sr. No.	Parameter	Peer Review	Self Appraisal
1	Contribution to timely completion of project	6	2
2	Cost control	5	3
3	Prevention of Rework	3	2
4	Litigation (Dispute prevention)	7	2
5	Quality	4	3
6	Periodic Reporting to H.O.	8	6

Determine Spearman's rank correlation coefficient for the above scenario.

- c) Four machines regularly produce luxury articles on an automated production line. [08]
 Machine 1, which manufactures 25% of the products, produces a defective product 1 times in 10; Machine 2, which manufactures 50% of the products, produces a defective product 1 times in 20; Machine 3, which manufactures 15% of the products, produces a defective product 1 times in 15; Machine 4, which manufactures 10% of the products, produces a defective product 1 times in 25; If, during random inspection, one product is selected at random, what is the probability that the selected product is defective? Also find the probability, if the product is defective, what is the probability that it has come from Machine 3?
 2 a) Explain different types of risks associated with construction projects with practical examples and elaborate on how and which mathematical tools will enable project managers to predict and hence mitigate these risks. [10]
 b) A tenderer is bidding for construction works, averagely 11 nos. in a year for the past 5 years. Find the probability that: [10]
 i. He gets atleast 9 works
 ii. He gets exactly 4 works
 iii. He does not get any work
 iv. He does not get more than 2 work
 v. He gets all the works

Also find the mean, standard deviation, variance and frequency of 'r' successes of the above scenario

3. a) Decide the optimum no. of associated units for the prime mover based on the following [12]
 data:
 i. Mean cycle time of the prime mover = 4 minutes
 ii. Mean haul time of the associated unit = 12 minutes
 iii. Haul Unit capacity – 5 cu.m.
 iv. Hourly cost of prime mover, C_p = Rs. 6000/-
 v. Hourly cost of associated unit, C_A = Rs. 700/-

Based on conventional practice, for this work, 5 associated units were assigned. Using Griffi's waiting line model, decide whether the associated units assigned are optimum or adding unnecessary.

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Discounts offered

Sr. No.	No. of bags	Discount (%)
1	50,000 and above	10
2	30,000 to 49,999	7
3	20,000 to 29,999	5
4	10,000 to 19,999	3
5	5,000 to 9,999	2
6	Below 5,000	No discount

A research related to godown management has revealed that cement deteriorates after 3 months and hence is not suitable for the intended use. Also it is found that there have been thefts associated with over-storage. The overstocking cost for the above scenario were linked up with the period of cement remaining idle as follows:

Depreciation of cement

Sr. No.	1	2	3	4
Period	3 months and less	3 to 4 months	4 to 5 months	5 months and above
Depreciation	4 % of unit price	9 % of unit price	15% of unit price	22% of unit price

Another research associated with work stoppages and production delays was carried out and understocking cost was carried out and understocking cost can be considered equivalent to 10% of the cost of total cement bags causing the understocking. Decide the order quantity to be purchased, based on uniform ordering period, so that the total cost of cement bags is minimum

6. a) Prepare a simulation model based on Monte-Carlo simulation to generate a range of random numbers, for the mean for the actual cost of 10 projects of similar nature as given below. Select suitable range for each. Run the simulation. (refer random number table given below) [12]

Project No.	Project cost (in Lakh Rs.)
01	41.23
02	58.71
03	62.27
04	13.48
05	88.91
06	43.01
07	49.81
08	95.22
09	18.23
10	42.28

Random Number Table

11164 36318 75061 37674 26320 75100 10431 20418 19228 91792 21215 91791
 08882 90870 12462 41810 01806 02977 36792 26236 33266 66583 60881 97395
 33827 92873 02953 85474 65285 97198 12138 53010 94601 15838 16805 61004
 12645 62000 78137 98768 04689 87130 79225 08153 84967 64539 79493 74917

- b) If 0.5% of door handles manufactured by a factory are defective, find the probability that [08]
 in a batch of 1 lakh such handles manufactured
- 50 handles are defective
 - 100 handles are defective
 - 25 handles are defective
 - No handles are defective

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(3 hours)

[Total Marks :80]

NB: 1) Attempt any 4 Questions

2) All questions carry equal (20) marks

3) Assume suitable data wherever necessary

1. a. Discuss Henry Fayol's principles of management. Describe Maslow's need hierarchy theory. 10
- b. Followings are the Construction Activities. Draw Project Network and Compute Total Float.& Free Float, Independent Float & Interfering Float 10

Activity	Duration	Activity	Duration
1-2	40	2-4	24
1-3	50	3-4	12
2-3	20	4-5	20

2. a. The Network for a project is shown below. The requirement of mason for each of the activities, has been shown over the arrows in network diagram. 12



Level out the requirement of the resource, if maximum number of mason, on any day, has to be limited to 7.

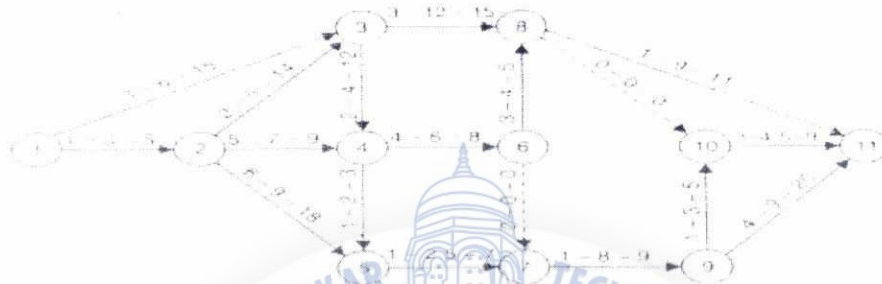
- b. Define Organization & Explain Functional organization. 4
- c. Write short note Job evaluation. 4
3. a. The following data refers to time motion study of a dumper loader operation for earth hauling: 10

Obs No	Time reqd for adjustment (sec.)	Time reqd to excavate and fill bucket (sec.)	Time reqd for swing (sec.)	Time reqd for lifting, positioning (sec.)	Time reqd to fill the dumper (sec.)
1	55	61	35	16	132
2	35.5	56	20.5	24.5	126.5
3	42.5	42	19.5	26.5	155
4	32	41.5	26	36	134.5
5	48	40	15.5	24.5	142

Based on statistical analysis (measures of dispersion), determine which sub-activity is most efficiently performed and which is least consistently performed. Comment on what may be the possible reasons for the poor performance of the sub-activity

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- b. Draw a Job Layout for High-rise Building project. 05
- c. Discuss the factors affecting site mobilization 05
4. a. Write a short note on administration of incentive schemes 06
- b. A Construction company has an opportunity to submit a bid for the construction of new apartment building. From the Specification provided by the developer, the PERT network along with the three time estimate (in week) for each activity are shown in figure. 08



Determine:

- i) Critical Path & its standard deviation.
- ii) Probability of completing the work in 40 weeks.
- iii) Completion time duration for which the company should bid to provide 90% probability of completing the project in time.
- c. Write a note Project Management consultant on a major infrastructure project. 06
5. a. What are the common accidents on various construction sites? Discuss the reasons for the same. 8
- b. Why should MSP or PRIMAVERA be used as a planning and scheduling tool on mega construction projects? 6
- c. Write a short note on the upcoming Mumbai Trans-Harbour link 6
6. a. The following data are available regarding the activities, their duration and costs for a particular project. The indirect cost of the project is Rs 3500/week. Determine the optimum cost and the duration of the project. 12

Activity	Normal Duration(weeks)	Normal Cost (Rs)	Crash Duration (weeks)	Crash Cost (Rs)
0-1	4	18000	3	25500
0-2	8	15000	5	19500
1-2	6	17000	4	19000
1-3	9	19000	7	26000
2-3	5	16000	3	22000

- b. Define Training and Enlist the objectives of the training? 4
- c. Discuss Project Management Life Cycle Concept. 4

Q.P. Code: 25329

(3 Hours)

Total Marks: 80

N.B 1) Answer any four questions.

2) Each main Question carries equal marks.

Q.1. a) What is Dispute Resolution Board? Explain the formation of D.R.B.

Also explain the merits of D.R.B.

---- 10M

b) In the context of "Sale of Goods Act" Explain the followings:-

1) Performance of Contract 2) Rules for delivery of goods.

---- 10M.

Q.2) Explain in detail the conditions of contract framed by M.O.S & P.I.

--- 20M

Q.3 a) What is an arbitration? Explain arbitration process in detail.

---- 10M.

b) Explain: - i) Pre-qualification of contractors ii) Pre-bid conference

----08M.

c) Define, Contingent Contract with an example.

--02M.

Q.4 a) What is EPC contract? Also explain features of EPC contract.

---- 10M

b) Explain the main provisions of Workmen Compensation Act-1923.

---- 10M

Q.5 a) Which are the trade unions connected with construction industry in India?

Explain about "Trade Union Act-1926"

---- 10M.

b) Explain: - i) B.O.T. contract ii) Professional Ethics

---- 10M.

Q.6) Write notes on followings (Any four)

--- 20M

1) Provisions of Minimum wages Act 2) E-Tenders

3) Indemnity 4) Cost plus contracts 5) Global Tenders

6) Escalation Clause.

Time 3 hrs

Max Marks 80

- Note: (1) Attempt any **four** questions out of **six** questions
 (2) Legible handwriting and practical, real time examples will be appreciated
 (3) Draw neat and clean sketches to explain concepts
 (4) Weightage will be given to the point explanation.

Qu. 1 Answer briefly any **four** of the following, each question carries five Marks. (20)

- Define disaster, explain with examples the difference between hazard and vulnerability.
- State the reasons about increase in the frequency of multiple fold of disaster.
- What precautions are expected in mass casualty management
- Define risk and suggest two ways of reducing risk with appropriate examples.
- Discuss in details role of NGO in disaster management

Qu 2

- Write an explanatory note on occurrence, causes and measurement of earthquake. List out some of the major earthquakes occurred in India. (10)
- Explain the physics of cyclone, state various types, How cyclones are tracked (10)

Qu.3

- How do floods takes place? What are the possible risk reduction measures? Comment about the flood management in India (10)
- Discuss about the types, causes and adverse effects of a landslide. What are the possible risk reduction measures? State the probable causes of some of the major landslides occurred during last two years. (10)

Qu. 4

- Write on community based disaster management (5)
- Explain Disaster Management Act and its provisions. (7)
- Discuss the administrative structure and the institutions set up to handle disasters (8)

Qu. 5

- What can be done to reduce the risk of mass casualty situations (6)
- How applications of GIS and remote sensing in disaster management is effective, explain (7)
- How the financing is done in case of disaster, especially a reconstruction phase. (7)

Qu. 6

- List financial institutions and functions of the same in case of disaster (20)
- Explain role of an international agencies in extreme events.
- Why provisions of sea walls and warning system are made across the world
- What are the possible way of carrying out mitigation measures in disasters

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Master's Civil - Choice Based - sem - I - RM

13/12/17

Q.P. Code: 26238

3 Hours

Total marks :80

Answer any four questions.

- Q.1** (20)
- What precautions will you take while storing and handling explosives? 04
 - State the roles & responsibilities of a material manager. 04
 - Explain VED Analysis and SDE Analysis. 04
 - What is a purchase order? Draw its typical format. 04
 - State the procedure for condemnation of an equipment. 04
- Q.2** (20)
- Explain Vendor Analysis and its importance. 08
 - Explain the challenges before HRM in Indian as well as global context. 07
 - Elaborate: i) Job Description ii) Job Specification iii) Job Design. 05
- Q.3** (20)
- State the factors to be considered while selecting construction equipments for a project. 07
 - How does jobsite layout & site inspection help in effective stores management? 07
 - How does performance appraisal help in capacity building of a workforce? 06
- Q.4** (20)
- Discuss the objectives & Function of Human resource Planning. 08
 - What is EOQ? The rate of use of a particular raw material from stores is 40/year. The cost of placing and receiving an order is Rs.80. The cost of each unit Rs200. The cost of carrying inventory in percent/year is 0.32 and it depends on the average stock. Determine i) The Economic order Quantity ii) if the lead time is 6 months, calculate reorder point. 08
 - Justify: Bulldozer is a versatile equipment. 04
- Q.5** (20)
- Carry out ABC analysis and comment on the same. 08
- | | | | | | | | | | | |
|---------------|-------|------|-----|-----|------|------|-------|-----|------|-----|
| Item No | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Unit cost | 5 | 11 | 15 | 8 | 7 | 16 | 20 | 4 | 9 | 12 |
| Annual Demand | 49000 | 3000 | 300 | 800 | 4700 | 1200 | 17000 | 400 | 5000 | 500 |
- What are the objectives & importance of employee training? 06
 - Write a note on indices used for assessing the effectiveness of inventory management. 06
- Q.6** (20)
- Earth is to be excavated from a pit and hauled to a construction site 2.4 kms away. Weight of earth = 1600 kg/m^3 , Swell of earth = 25 %, Haul resistance & Rolling resistance both are 23 kg/tonne. Earth will be excavated using a power shovel with an output of $214 \text{ m}^3/\text{hour}$. Excavated earth will be hauled using tractor pulled dump wagon which is initially located at the excavation pit. The tractor engine is of 200 HP while the wagon capacity is 12 m^3 heaped volume. The combined weight of tractor and wagon is 16700 kg. Speed of hauling vehicle in empty and full condition is 50 kmph and 30 kmph respectively. Calculate the number of trips required, number of hauling units needed and Volume hauled per unit. 10
 - Enlist different drilling equipments. Differentiate between Percussion drill and Abrasion drill. 10