Bachelor of Metallurgical & Material Engineering Examination, 2025

(3rd Year, 1st Semester)

Open Elective

Industrial Management

Duration: 3 Hours **Full Marks: 100**

Different parts of the same question should be answered together

Answer any five questions.

1) (a)

From the information provided in the following table, draw out the network diagram and find the critical path by activity on arrow method. How long the project will take to be completed? **8 + 5 + 2**

Activity	Predecessors	Duration (Days)
A	----	6
B	A	4
C	B	7
D	A	2
E	D	4
F	E	10
G	----	2
H	G	10
I	J, H	6
J	----	13
K	A	9
L	C, K	3
M	I, L	5

(b) Describe project crashing. **5**

(2) (a) Enumerate the steps in preparing a control chart. **4**

(b) Explain 3 aspects of quality. **6**

(c) Prepare a C chart on a graph paper from the following data: **10**

Data for defects on TV set from 20 samples (sample size = 10) are shown in the table below:

Sample No.	No. of Defects	Sample No.	No. of Defects	Sample No.	No. of Defects	Sample No.	No. of Defects
1	5	6	4	11	6	16	5
2	4	7	5	12	5	17	4
3	5	8	6	13	4	18	6
4	6	9	8	14	7	19	6
5	4	10	7	15	6	20	6

(3) **(a)** What are the assumptions of EOQ without back order and volume discount? **4**
(b) Derive EOQ by using differential calculus, with appropriate diagram and notations. **7**
(c) An item has a yearly demand of 6000 units. The different costs in respect of make and buy options are as follows. Determine the best option. **9**

	Buy (Rs.)	Make (Rs.)
Item cost / unit	11.00	10.00
Ordering cost / order	200.00	
Set up cost / set up		140.00
Annual carrying cost / unit / year	1.00	2.00
Production rate per year		12000 units

(4) **(a)** Describe process production. **6**
(b) Present a diagram of production process. **4**
(c) Describe MRP with an appropriate illustration. **10**

(5) **(a)** Why is motivation important? **8**
(b) Describe Maslow's Need Hierarchy theorem with an appropriate illustration. **12**

(6) **(a)** Explain benefits of resource allocation in project management. **8**
(b) Why is resource allocation important in project management? **5**
(c) State resource allocation methods. **7**

(7) **(a)**

Year	Expenditure (Rs. in Crore)
2018	25
2019	30
2020	35
2021	45
2022	55

Project the business expenditure on new plant equipment for the year 2024 by trend projection method. **10**

(b) A time study was conducted on a job consisting of three elements. Stop watch readings in hundredth of a minute are given. Using cumulative timing method along with rating factors calculate the standard time if allowance in percent is 12%. **10**

Element	Stop Watch Readings					Rating
	1	2	3	4	5	
A	15	73	139	203	266	80
B	25	88	155	218	280	100
C	64	128	193	257	320	110