BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BE **SEMESTER : V**
BRANCH: ALL **SESSION : MO/19**

SUBJECT: PE5011 PROJECT ENGINEERING

TIME: 3 HOURS **FULL MARKS: 60**

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a) Classify project deliverables? Give one example for each type. [2]

Q.1(b) Identify the project types for the following cases: [4]

- An auto manufacturer to start a new plant to meet the increasing demand
- A machine tool manufacturer replacing some old machines with imported ones
- A construction company handling a project of linking all major rivers spread over several states with numerous bridges, tunnels etc.

A foundry based firm plans to grind/finish the engine block castings.

Q.1(c) Explain the role of commercial appraisal, technical appraisal and management appraisal in the success of projects. [6]

Q.2(a) Write the need of 'organizational structure' for a project. [2]

Q.2(b) Compare between functional organization and product organization along with two examples for each. [4]

Q.2(c) Compare between matrix and modified-matrix structure of organization clearly stating the advantages and limitations. [6]

Q.3(a) Differentiate between 'benefits' and 'costs' associated with a typical project. [2]

Q.3(b) What do know by the iron triangle of project? Give a description. [4]

Q.3(c) Explain the life cycle of a project along with the detailed activities in each stage. [6]

Q.4(a) What is a Gantt chart and what are the limitations of it? [3]

Q.4(b) Construct the project network (activity on arc type) [9]

Activity	Immediate Predecessors	Duration (Days)
A	--	2
B	A	6
C	A	3
D	B	1
E	B	6
F	C, D	3
G	E, F	2

(i) Identify the critical path.
(ii) Find the free and independent float for each activity and present in a tabular form.
(iii) What is the effect of delaying activity D by three days?

Q.5(a) Why a dummy activity is used in a network? [2]

Q.5(b) Give a short note on Fulkerson's rules. [4]

Q.5(c) Differentiate among total, free and independent floats of activities. Explain how these floats are utilized by different level of management. [6]

Q.6(a) Explain the meaning of crashing of a project. Why 'crash cost' is more than the 'normal cost' of a project? [6]

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Q.6(b) Construct the network for the data given in the table and find the minimum time to complete the project (i) without crashing (ii) with crashing [6]

Activity	Normal time	Crash time
A (1-2)	6	4
B (1-3)	8	4
C (1-4)	5	3
D (2-4)	3	3
E (2-5)	5	3
F (3-6)	12	8
G (4-6)	8	6
H (5-6)	6	6

Q.7(a) Discuss about the time-cost trade-off and explain the role of fixed cost in finding the least-cost schedule of a project. [2]

Q.7(b) Give a detailed description of the project review method, LOB (Line of Balance) applied at a particular instant of time. [4]

Q.7(c) How the project manager carries out 'resource levelling'? Cite an example to explain the various constraints associated with it. [6]

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