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ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)  
ORGANISATION OF ISLAMIC COOPERATION (OIC)  
DEPARTMENT OF MECHANICAL AND PRODUCTION ENGINEERING

Semester-Final Examination

Summer Semester, A.Y. 2022-2023

Course No. IPE 4805

Time : 3 hours

Course Title: Project and Environmental Management

Full Marks : 150

Answer all 6 (Six) questions. Marks in the margin indicate the full marks.

- 1a) **Explain** the application of the project evaluation and review technique (PERT) in project management. **State** your understanding about the PERT calculator. **Illustrate** the physical implications of standard deviation or variance in PERT analysis. 10  
CO2  
PO11

- 1b) A small project consisting of eight activities has the following characteristics: 15  
CO2  
PO11

Activity	Preceding activity	Optimistic time (months)	Likely time (months)	Pessimistic time (months)
A	-	2	4	12
B	-	10	12	26
C	A	8	9	10
D	A	10	15	20
E	A	7	7.5	11
F	B, C	9	9	9
G	D	3	3.5	7
H	E, F, G	5	5	5

- i. **Draw** the PERT/CPM network for the project.
- ii. **Prepare** the activity schedule for the project. For each activity, **apply** the following box (tool) in the PERT network.

Activity: A	
Time:	
ES =	EF =
LS =	LF =
Slack =	

- iii. Determine the critical path (show critical path, expected project time, and variance of the project).

- 2a) **Describe** the importance of project organization in manufacturing parts and assembling of them to produce (say) 1,000 units of a bicycle in a month. 5
- 2b) **Explain** a hybrid project organization structure and state how it is better than functional and projectized organizational structures. 15
- 2c) **Enumerate** and **describe** the key issues a project manager should know about environmental economics. 5  
All  
CO1  
PO11

- 3a) **Discuss** the strength, weakness, and applicability of two methods of EIA. State the basic criteria to select an appropriate methodology for a specific project. 13  
CO3  
PO12
- 3b) A car washing and lubricating company has been operating for several years (more than 10 years) in a land with the following characteristics: porous, filterable with a level near to the surface (1.5 m depth). The company is located close by to an estuary (river mouth) branch which is quite useful for them since they discharge all the disposal and waste generated by this activity directly into the estuary. These disposals contain a high level of oils and greases. All the dumping from the car maintenance goes directly into the soil since there are no palettes or drainage. The company operates for 20 hours seven days per week. The local people have complained to the municipality authority on environmental issues, and it has arranged the execution of an EIA and suppose you are a part of it. Think critically and 12  
CO3  
PO6
- i. **Mention** three environmental impacts of this activity.
- ii. **Highlight** three mitigation measures you will propose as part of your Environmental Management Plan (EMP) to mitigate the impacts identified.
- 4a) **Describe** the six global sustainability objectives (GSOs). 6
- 4b) **Discuss** the main challenges of sustainable development. 6
- 4c) **Explain** how the United Nation's sustainable development goals (SDGs) are going to affect engineering core competencies. Write statements and use diagram/s. CO3  
PO6
- 4d) **Write** a short essay on the Montreal Protocol. 7  
6  
CO3  
PO7
- 5a) **Describe** the rationale of remanufacturing in today's context. 6
- 5b) **State** and **explain** the main policy dimensions for increased remanufacturing. 6  
CO3
- 5c) **Show** a process flow chart on remanufacturing and indicate where you can use multi-criteria decision-making models. PO6  
8
- 5d) As an engineer and a conscious citizen, **discuss** your possible role in remanufacturing. PO7  
5  
CO3  
PO12
- 6a) *Climate change has become a BURNING issue for the existence of the entire ecosystem.* **Explain** this statement with figures/diagrams and the relevant records. 12  
CO4  
PO7
- 6b) Islam encompasses knowledge in all aspects, and it provides the guidelines to the solutions of all human and climate problems. **Write an essay** on the Islamic view of climate preservation from the point of sustainable development, value-added use of resources, urgency of plantation, preservation of water bodies, maintenance of air quality, and pollution control. 13  
CO1  
PO8

-End of the question paper-