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

Mid-Semester Examination   Summer Semester, A.Y. 2022-2023
Course No. IPE 4805   Time   : 1½ hours
Course Title: Project and Environmental Management   Full Marks : 75

Answer all **3 (Three)** questions. Marks in the margin indicate the full marks.

1a) Looking into the various aspects learnt through this course, mention 10 areas that a project manager should know to come up with successful project management.
    10
    PO11

b) Mentioning their distinctive and similar features, justify the relevance of joint consideration of modern and traditional project management concepts today. Write the key points adequately.
    7
    PO11
    8

c) Discuss and argue project management with special emphasis on time and resources utilization from Islamic perspective.
    PO8
    All
    CO1

2. An established company has decided to add a new product to its production lines. It will buy the product from a manufacturing plant, package it, and sell it to several distributors that have been selected on a geographical basis. Market research has already indicated the volume expected and the size of sales force required. The steps shown in the following table are to be planned.
    25
    CO2
    PO11

Activity	Description	Predecessor	Duration
A	Organize a sales office	–	14
B	Hire salesman	A	4
C	Train salesman	B	2
D	Select advertising agency	C	1
E	Select Plan advertising campaign	A	2
F	Conduct advertising campaign	E	3
G	Design package	E	2
H	Setup packaging campaign	E	4
I	Package initial stocks	H, L	3
J	Order stock from manufacturer	K	12
K	Select distributors	D, F, G	4
L	Sell to distributors	J	2
M	Ship stocks to distributors	H, L	2

  i. Construct an activity on arrow network based on the activity descriptions below. Show all your work. Label activities in the network by their activity letters and node numbers. Remove any redundant dependencies and label dummy activities.

  ii. Construct a precedence network based on the same activity descriptions below. Show all your work. Label activities in the network by their activity letters and node numbers. Remove all redundant dependencies and arrange activities in proper sequence steps.

  iii. Indicate the critical path and critical duration.

  iv. For each non-critical activity, find the total and free float.

3. Activities of a project are shown along with the estimated times (week) in the Table below: 25

CO2
PO11
PO12

Activity (1)	Immediate predecessor (2)	Most likely time (3)	Most pessimistic time (5)	Expected time (6)	Std deviation (8)	Variance
A	—	2	3	4	0.33	7
B	—	3	5	8	0.5	
C	B		10	15	0.83	5
D	A, C		10	12		7
E	D		5	6	0.5	7
F	C		12	12		18
G	F		8	10	0.83	
H	F		15	17		20
I	B		20	25		7
J	H, E, G		25	25		1.67

i. Draw the activity diagram in project nodes, as well as calculate the critical path for these activities.

ii. Obtain the estimated times (column 6) and missing standard deviations and variances in columns (7) and (8) of each activity with the PERT method (copy only the activity and those three columns in your answer booklet).

iii. Calculate the early start and early finish times, late start, and late finish times (ES, EF, LS, LF), using the PERT method.

iv. If the CPM durations are the same as the expected time, shall there be any difference in project time between CPM and PERT methods.

v. Find the variance of the critical path and calculate the probability of finishing the project after 25 weeks, assume that everything goes as per the plan.

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Standard Normal Distribution Probabilities Table