RESEARCH METHODOLOGY & PROJECT MANAGEMENT
(HMTS 6101)

Time Allotted : 3 hrs

Full Marks : 70

*Figures out of the right margin indicate full marks.*

Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
### (Multiple Choice Type Questions)

1. Choose the correct alternative for the following: $10 \times 1 = 10$

(i)   If Hypothesis is false and decision is to accept it, then it is a
(a) type I error   (b) β - risk
(c) correct inference   (d) α –risk.

(ii) Basic research is conducted
(a) to ponder History   (b) enhance knowledge
(c) for ethnography   (d) for commercial mileage.

(iii) Stratified sampling is
(a) non-probability sampling   (b) random sampling
(c) quota sampling   (d) probability sampling.

(iv) Divisional organisation is suitable for
(a) reengineering projects   (b) big projects
(c) project with limited scope   (d) procurement project.

(v)   Sample size should be .... if the confidence interval of the experiment is increased from 95% to 99%
(a) more   (b) less
(c) constant   (d) both (a) & (c).

(vi) Characteristics of population is termed as
(a) statistic   (b) parameter   (c) mean   (d) variance.

(vii) Measurement scale used to ascertain the level of satisfaction during customer survey is
(a) nominal scale   (b) ratio scale
(c) ordinal scale   (d) interval scale.

(viii)   What is the significance of event 'E' in the following diagram
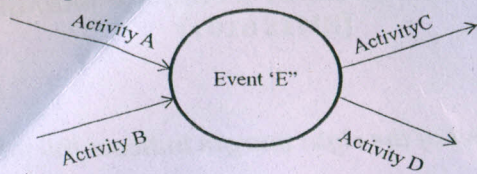
(a) Burst   (b) Merge
(c) Dummy   (d) Burst & Merge.

(ix)   State the alternative hypothesis applicable to the following
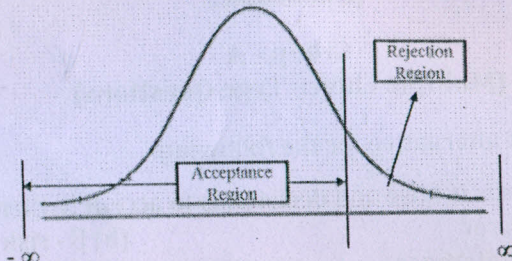
(a) $H_1 < H_0$ (b) $H_1 \geq H_0$
(c) $H_1 > H_0$ (d) $H_1 \neq H_0$.

(x)   Following method of financial appraisal of projects does not consider time value of money
(a) NPV method   (b) Payback method
(c) DCF method   (d) IRR method.

Group – B

2. (a)   Enlist the types of sampling techniques. Describe Snowball sampling.

    (b)   Narrate the assumptions made while conducting ANOVA.

                                                    (5 + 4) + 3 = 12

3. (a)   Report prepared by the Economic Research Department reveals that average annual family income in a Metropolis is Rs.48,432. What do you conclude about the validity of the report if a random sample of 400 families shows an average income of Rs.48,574 with a variance of 4×10^6?

    (b)   Give a brief account of one sided hypothesis for test of means.

                                                    8 + 4 = 12

Group – C

(a)   Explain the characteristics of project.

(b)   Distinguish Balanced and Unbalanced projects.

                                                    6 + 6 = 12

(a)   How is project cost estimated? Give examples of a few pre-operative expenses.

(b)   What is the advantage of NPV method over Rate of return method in relation to financial evaluation of projects? Illustrate with an example.

                                                    (5 + 2) + 5 = 12

Group – D

(a)   What are the significant differences in the roles & responsibilities of Project Manager and Functional manager?

(b)   How does LOB enhance management control?

                                                    7 + 5 = 12

(a)   The following are measurements of the air velocity and evaporation coefficient of burning fuel droplets in an impulse engine -

Air velocity (cm/s)	20	60	100	140	180	220	260	300	340	380
Evaporation coefficient (mm²/s)	0.18	0.37	0.35	0.78	0.56	0.75	1.18	1.36	1.17	1.65

Fit a straight line to these data by the method of least squares, and use it to estimate the evaporation coefficient of a droplet when the air velocity is 190 cm/s.
[Consider Air velocity as 'x' and Evaporation coefficient as 'y' for computation]

(b)   Highlight the significance of Karl Pearson Coefficient of Linear Correlation.

                                                    9 + 3 = 12

Group – E

8. (a) Activity schedule of a construction project is tabulated below –

Activity	(1) - (2)	(1) - (3)	(3) - (7)	(1) - (4)	(2) - (5)	(3) - (4)	(4) - (5)	(5) - (6)	(4) - (6)	(6) - (7)	(5) - (7)
Activity duration (days)	40	46	48	16	38	32	0	0	36	20	8

(i) Draw the network & Calculate the total project duration.

(ii) Find the total float for each activity.

(iii) Is there merge & burst events in this project? If yes, which are they?

(b) What is the significance of Dummy activity in the context of network design?

$(5 + 3 + 2) + 2 = 12$

9. Write short note on any three of the following: $3 \times 4 = 12$

(i) Null Hypothesis

(ii) Applied Research

(iii) Nominal scale

(iv) Project life cycle

(v) Fulkerson's rule for network design.