RESEARCH METHODOLOGY AND IPR
(AEIE 5103)

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 × 1 = 10**

   (i)   An essential Criterion of Scientific study is_____.
      (a) belief   (b) value   (c) objectivity   (d) subjectivity

   (ii)   A short summary of Technical Report is called_____.
      (a) Article   (b) Research abstract   (c) Publication   (d) Thesis

   (iii)   Research and Development become the index of development of country. Which of the following reasons are true with regards to this statement?
      (a) Because R&D reflect the true economic and social conditions prevailing in a country
      (b) Because R&D targets the human development
      (c) Because R&D can improve the standard of living of the people in a country
      (d) All the above.

   (iv)   The data of research is ____.
      (a) qualitative only   (b) quantitative only
      (c) both (a) and (b)   (d) neither (a) nor (b)

   (v)   The first page of the research report is
      (a) Appendix   (b) Bibliography   (c) Index   (d) Title page

   (vi)   Type-I Error occurs if _____.
      (a) the null hypothesis is rejected even though it is true
      (b) the null hypothesis is accepted even though it is false
      (c) both the null hypothesis as well as alternative hypothesis are rejected
      (d) none of the above

(vii) Drawing a sample from each stratum in the proportion to latter's share in the total population is called _____.
(a) stratified sampling   (b) proportional stratified sampling
(c) disproportionate sampling   (d) quota sampling

(viii) In India, the literary work is protected until
(a) lifetime of author   (b) 25 years after the death of author
(c) 40 years after the death of author   (d) 60 years after the death of author.

(ix) Which one of the following can be patented?
(a) Machine   (b) Process
(c) Composition of matter   (d) All of the above.

(x) Intellectual Property Rights (IPR) protect the use of information and ideas that are of
(a) ethical value   (b) moral value
(c) social value   (d) commercial value.

Group – B

2. (a) Differentiate between research methods and research methodology.
(b) Describe various steps of research process with the help of a block diagram.
(c) What are the criteria of good research work?

2+ 7 + 3 = 12

3. (a) What are mean and variance of sample data? State Baye's rule of posterior probability.
(b) In a random selection of 64 of the 2400 intersections in a small city, the mean number of scooter accidents per year was 3.2 and the sample standard deviation was 0.8.
(i) Make an estimate of the standard deviation of the population from the sample standard deviation.
(ii) Work out the standard error of mean for this finite population.
(iii) If the desired confidence level is 0.90, what will be the upper and lower limits of the confidence interval for the mean number of accidents per intersection per year?

(3 + 3) + 6 = 12

Group – C

4. (a) What are null hypothesis and alternative hypothesis?
(b) A manufacturer of switch assures a mean life of 2000 Hrs with a standard deviation of 200 Hrs based on their testing for a large number of samples over a period of time. Later on the company made a small change in the spring. To determine whether this has changed the life of the switch, a sample of 100 switches tested to give a sample mean as 1960 Hrs and standard deviation to 180. Is there a change in the product?

4 + 8 = 12

5. (a) Distinguish between confidence level and significance level.
(b) Write down different steps of report writing.

6 + 6 = 12

Group – D

6. (a) Explain Intellectual Property Right (IPR) in brief. What do you mean by copyright?
(b) Name the industrial properties on which IPR can be made.

(4 +3) + 5 = 12

7. (a) What do you mean by the Semiconductor Integrated Circuits Layout Designs Law (SICLD) Act, 2000?
(b) State the importance of Trade Mark?
(c) From which characteristics, will you identify a registered trademark?

4 + 4 + 4 = 12

Group – E

8. (a) Why should there be research ethics?
(b) Describe the different forms of Scientific misconduct. Explain the importance of patent.

4+ (5 + 3) = 12

9. (a) Describe copyright law with illustrative examples.
(b) "For most products every form of intellectual property rights can be obtained"- Justify the above statement by taking an example of a product like "Camera".

(3 + 3) + 6= 12