CHIEF (DECENTRALISED PLANNING, CHIEF (PLAN CO-ORDINATION DIVISION) IN STATE PLANNING BOARD

Paper II

QUESTION CODE : 114/2018

Maximum : 100 marks

Time : 2 Hours

1. **What is decentralized planning ? (2 Marks)**
2. **Summarize the major provisions in the 73rd and 74th constitutional amendments for effective decentralization. (4 Marks)**
3. **Discuss the historical evolution of local self governments in Kerala (4 Marks)**
4. **Critically examine the various sources of financing the plans for local self government institutions. (5 Marks)**
5. **Examine the general considerations relating to cost-benefit analysis for project appraisal. (10 Marks)**
6. **A random sample 2.1, 2.7, 2.3, 2.9 is taken from the uniform distribution over $(\theta-1/2, \theta+1/2)$. Is sample mean an MLE of θ ? (2 Marks)**
7. **What is the significance of principal component analysis ? (4 Marks)**
8. **Write down the expressions for the Horvitz-Thompson estimator of the population total and its variance. (4 Marks)**
9. **Let $\{X_n\}$ be a Markov chain with state space $S = \{-1, 0, 1\}$ and transition probabilities $P_{-1,0} = 1/2$, $P_{-1,1} = 1/2$, $P_{0,-1} = 1$, $P_{1,0} = 1$ and zero otherwise. Examine whether $Y_n=|X_n|$; $n\geq 0$ is a Markov chain. (5 Marks)**
10. **Obtain UMP test for testing $H_0 : \theta \leq \theta_0$ against $H_1 : \theta > \theta_0$ based on a radom sample of size n from a population with p.d.f. $f(x; \theta) = e^{-(x-\theta)}$; x>**

θ and 0 elsewhere. (10 Marks)

11. What do you mean by is NITI Aayog ? (2 Marks)

12. What is communication? Discuss formal and informal communication. (4 Marks)

13. What is TQM? State the benefits of TQM in an organization. (4 Marks)

14. What is span of management? State the factors determining an effective span. (5 Marks)

15. What do you mean by decision making? Discuss the steps involved in decision making process. (10 Marks)

16. Prove that similar matrices have the same characteristic polynomials (2Marks)

17. Prove that continuous image of an interval is an interval. (4 Marks)

18. Consider the data of the project to find its critical path and project duration. (4 Marks)

Activity:	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Predecessor :	**-**	**-**	**A**	**B**	**C, D**	**B**	**E**	**E**	**F, G**
Duration (Days) :	**4**	**7**	**2**	**1**	**6**	**5**	**2**	**10**	**4**

19. Let $f \in R[a,b]$ and $f(x)={}_a\int^x f(t)\,dt$ where $x \in [a, b]$. Prove the following :
(a) F(x) is continuous on [a,b].
(b) F (x) is differentiable if f (x) is continuous on [a,b]. (5 Marks)

20. (a) Find the general solution of $(x^2 -1)\, y'' - 2xy' + 2y = (x^2-1)^2$ using the method of variation of parameters.

(b) Find the cosine series for the function defined by

$f(x) = \frac{1}{4} - x,\ 0 \le x < \frac{1}{2}$

$= x - \frac{3}{4},\ \frac{1}{2} \le x \le 1.$ (5 + 5 Marks)