



NICMAR University, Pune

NICMAR Doctoral School

NICMAR Ph.D. Admission Test (NPAT) SAMPLE PAPER

The sample question paper is for illustrative purpose to help the aspirants to understand the format and type of questions they might encounter in the actual examination.

PAPER II

School: NICMAR Business School (NBS)

Part A

1. Which of the following attitudinal characteristics that guide individuals in career planning?
 - a. Career Ladder
 - b. Career Goals
 - c. Career Anchors
 - d. Career Path

2. Glass ceiling refers to
 - a. Artificial barriers rooted in organizational and attitudinal biases that hinder career growth of women
 - b. Weak personalities of women that hinder career growth
 - c. Transparency at higher levels in organizations
 - d. Difficulty that women have in managing both work and home

3. Who gave the concept of Id, Ego and Superego within personality, which impacts human behaviour?
 - a. Sigmund Freud
 - b. Thomas A. Harris
 - c. Muriel James
 - d. Eric Berne

4.integrates supply and demand management within and across companies
 - a. Supply Chain Management
 - b. Operations
 - c. Marketing
 - d. Quality

5. Presently in India, Rupee convertibility in foreign exchange is

- a. Restricted
b. Partial
- c. Full
d. None of the above
6. The following is true in the context of Modified Internal rate of return (MIRR)
- a. Eliminates the problem of Multiple IRRs
b. Assumes that the project cash inflows are reinvested at cost of capital
- c. Useful in the case of unconventional cash flows of a project
d. All of the above
7. Who proposed the 4-P's of marketing?
- a. Neil Borden
b. Theodore Levitt
- c. Abell & Hammond
d. Edmund McCarthy
8. Cost-cutting becomes the strategy of survival in _____ stage.
- a. Introduction
b. Maturity
- c. Growth
d. Decline
9. Product Alpha consists of two units of component X and four units of component Y. Component X consists of four units of component Y and two units of component Z. Component Y's lead time is two weeks, there are no units of component Y on hand, and there are no scheduled receipts for component Y. There are 400 units of component X on hand. Neither X nor Y go into any other item or subcomponent. If 100 units of Alpha are to be produced beginning in week 4, then _____ units of component Y will need to be begun in week _____.
- a. 400; 3
b. 1,200; 1
- c. 800; 3
d. 400; 2
10. A researcher is testing a hypothesis of a single mean. The critical z value for $\alpha = .05$ and a two-tailed test is +1.96. The observed z value from sample data is -2.11. Based on this, the researcher will:
- a. Redefine the Null Hypothesis
b. Reject the Null Hypothesis
c. not reject the null hypothesis
- d. redefine the alternate hypothesis

Part B

Specialisation – Construction and Allied Economics

- Steel manufacturing company is considering raising the price of steel. They want to estimate the potential impact on their total revenue. How can they use the concept of elasticity of demand to make this decision?
- Heavy rainfall in Kerala has reduced the production of Bricks. Analyze the impact of this on the market for brick, including the equilibrium price and quantity.

Specialisation – Marketing

1. How do industrial buyers differ from consumers?
2. How do retailers use visual merchandising?

Specialisation – Operations & Supply Chain

1. Discuss the different risks that global sourcing involves. What strategies and practices should a firm adopt for mitigating and eliminating such risks?

Jack's Machine Shop has the following batch of jobs that need to be scheduled so that the makespan is minimized. Each job is processed first at Machine Centre 1 and then at Machine Centre 2.

The job information is as follows.

Job	Machining centre 1 processing time(days)	Machining centre 2 processing time(days)
A	4	3
B	2	7
C	6	5
D	4	5
E	3	4
F	5	1

2. Using Johnson's rule, develop a sequence for Jack's Machine Shop that minimizes makespan.

Specialisation – Finance

1. Critically examine three propositions of Efficient Market Hypothesis.
2. Describe efficient frontier established by Harry Markowitz of Modern Portfolio Theory.

Specialisation – Human Resource Management

1. What is 360-degree feedback?
2. What is the relevance of SMART goals in management by objectives (MBO)?

School: School of Project Management (SoPM)

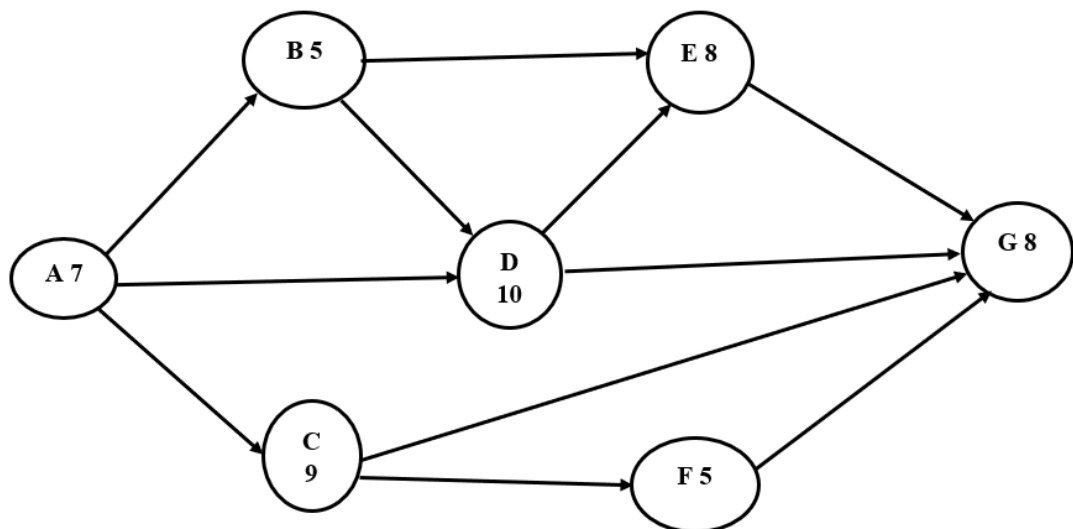
Part A

- Which of the following is not an input to the creation of the project charter?
 - Contract
 - Responsibility assignment matrix
 - Business case
 - Project statement of work
- Which of the following is not part of managing interpersonal relationships?
 - Communication
 - Leadership
 - Problem solving
 - Scope, cost, time estimate techniques
- Which of the following methods is used to predict project duration by analysing the sequence of activities that has the least amount of scheduling flexibility?
 - Critical path method
 - Dependency diagramming
 - Gantt chart
 - Delphi Technique
- The CEO of your company wants a monthly schedule update of your project. Which of the following would you send to this executive?
 - Activity on node diagram
 - Milestone chart
 - Network precedence diagram
 - PERT chart
- Which approach to quality improvement is least likely to produce positive results?
 - Continuous process improvement
 - Increased inspection
 - ISO 9000 certification
 - Plan Do Check Act Cycle
- Your company established an acceptable budget variance of + or – 5 quality audits for every project. On a monthly basis, projects may have a budget variance outside the acceptable range, provided this does not happen more than twice in a row. What quality tool should you use to evaluate your project's cost variance over the past two years?
 - Ishikawa diagram
 - cause and effect diagram
 - Control chart
 - Flow chart
- Your project uses the principles of 360-degree feedback. Based on these principles, performance evaluations can come from various sources but not from_____.
 - Superiors
 - peers
 - Subordinates
 - Evaluatees

8. You have been provided with a document that contains the market demand and cost benefit analysis that justifies the go ahead of the project. What is this document called?
- A contract
 - A statement of work
 - A business case
 - An organizational process asset
9. You are asked to review a project that another department has planned for your organization. Your line manager asks you to know her a project overview that displays only the start and end dates of major deliverables, along with key external dependencies. This graphic is known as a _____
- Network diagram
 - Summary bar chart
 - Milestone chart
 - Schedule baseline
10. The project archive you are reviewing shows that the project has had a number of changes to the start and finish dates of the baseline schedule. What are these changes known as?
- Schedule variance analysis
 - Schedule baseline updates
 - Approved change requests
 - Performance reviews

Part B

- Discuss few roles and responsibilities of a Project Manager.
- For the following project network, identify critical path and compute project duration.



School: School of Architecture and Planning (SAP)

Part A

1. Urban renewal primarily focuses on:
 - a. Expanding urban areas into rural regions
 - b. Preserving historical monuments
 - c. Revitalizing deteriorated urban neighbourhoods
 - d. Increasing green spaces in urban areas

2. Which theory in urban planning emphasizes the importance of the built environment in shaping social behavior?
 - a. Rational Planning Theory
 - b. Urban Ecology Theory
 - c. Behavioral Planning Theory
 - d. Systems Theory

3. What is the main objective of implementing a metered water supply system in urban regions?
 - a. To reduce the number of water consumers
 - b. To monitor and control water consumption
 - c. To provide free water to all households
 - d. To increase water supply duration

4. What is the main purpose of secondary treatment in wastewater management?
 - a. To remove dissolved organic matter
 - b. To filter out large particles
 - c. To disinfect the water
 - d. To remove heavy metals

5. What is a "shapefile" in GIS?
 - a. A file format for storing raster data
 - b. A type of GIS software
 - c. A format for storing geographic vector data
 - d. A tool for drawing maps

6. What is LiDAR commonly used for in urban planning?
 - a. Monitoring air quality
 - b. Creating high-resolution elevation models
 - c. Capturing visible light imagery
 - d. Tracking wildlife migration patterns

7. Which sector is often the largest contributor to carbon emissions and thus a key target for decarbonization efforts?
 - a. Agriculture
 - b. Healthcare
 - c. Transportation
 - d. Information Technology

8. According to the IPCC, which urban planning strategy is essential for mitigating the impacts of climate change and enhancing disaster resilience?
 - a. Prioritizing fossil fuel-based energy infrastructure
 - b. Expanding urban sprawl without considering environmental impacts

- c. Reducing investment in renewable energy sources
 - d. Integrating climate-resilient infrastructure and land use planning
9. Which factor is NOT considered in road capacity calculations?
- a. Road width
 - b. Vehicle type
 - c. Weather conditions
 - d. Driver's age
10. Which is the first step in the transportation planning process?
- a. Implementation
 - b. Problem identification
 - c. Public consultation
 - d. Evaluation

Part B

Specilisation – Planning

1. What is the importance of GIS in urban planning?
2. Describe Urban Heat Island effect and support it with examples in the Indian context.

School: School of Construction (SoC) & School of Engineering (SoE)

Part A

1. For road construction in Rajasthan bitumen with _____ penetration value and _____ softening point is used.
 - a. Low, high
 - b. High, high
 - c. Low, low
 - d. High, low
2. Which of the following is not true with respect to rigid pavements?
 - a. Has low maintenance cost
 - b. Thermal stresses are induced
 - c. Has low flexure strength
 - d. Has more life span
3. The porosity of soil is 40%. Its voids ratio is
 - a. 0.53
 - b. 0.67
 - c. 0.71
 - d. 0.49
4. In construction management, what does the acronym EPC stand for?
 - a. Engineering, Procurement, Coordination
 - b. Engineering, Procurement, Construction
 - c. Efficiency, Productivity, Collaboration
 - d. Execution, Performance, Completion
4. In a construction project, if the actual duration of an activity is less than the planned duration, then the schedule performance index (SPI) will be _____.
 - a. greater than 1
 - b. less than 1
 - c. equal to 1
 - d. negative
5. A column of height h with a rectangular cross section of size $a \times 2a$ has a buckling load of P . If the cross section is changed to $0.5a \times 3a$ and its height is changed to $1.5h$, the buckling load of the redesigned column will be
 - a. $P/12$
 - b. $P/4$
 - c. $P/2$
 - d. $3P/4$
6. An element is subjected to biaxial normal tensile strains of 0.0030 and 0.0020. The normal strain in the plan of maximum shear strain is
 - a. zero
 - b. 0.001
 - c. 0.0025
 - d. 0.005
7. A fine grained soil has 60% (by weight) silt content. The soil behaves as semi-solid when water content is between 15% and 28%. The soil behaves fluid like when the water content is more than 40%. The "Activity" of the soil is
 - a. 3.33
 - b. 0.42
 - c. 0.3
 - d. 0.2
8. Which one of the following options contains ONLY primary air pollutants?
 - a. Hydrocarbons and Nitrogen oxides
 - b. Hydrocarbons and ozone

- c. Ozone and peroxyacetyl nitrate d. Nitrogen oxides
9. The velocity of propagation of pressure wave in a fluid medium of bulk modulus 8 KN/mm^2 and density 2000 kg/m^3 is
- e. 1000 m/sec g. 3000 m/sec
f. 2000 m/sec h. 1200 m/sec
10. The electromagnetic spectrum band is commonly used in Remote Sensing for vegetation studies
- a. Visible c. Ultraviolet
b. Infrared d. Microwave

Part B

Specialisation - Construction Materials

1. Discuss the challenges associated with pumping concrete to great heights in high-rise construction projects.

Specialisation - Concrete technology

1. Differentiate between cone penetration test and standard penetration test

Specialisation - Construction Management (Inclusive of soil mechanics & Foundation engg, transportation and highway pavements and fluid mechanics)

1. How do water-permeable building materials like porous concrete or interlocking pavers contribute to stormwater management and urban sustainability?

School: School of Energy & Environment (SoEE)

Part A

1. Which architectural style is known for its emphasis on symmetry, order, and classical motifs?
 - a. Gothic
 - b. Renaissance
 - c. Art Deco
 - d. Brutalism
2. The principle of 'form follows function' in architecture is associated with:
 - a. Frank Lloyd Wright
 - b. Le. Corbusier
 - c. Ludwig Mies van der Rohe
 - d. Louis Sullivan
3. What is the purpose of a building code?
 - a. To enforce architectural styles
 - b. To ensure buildings are safe and meet minimum standards
 - c. To restrict creativity in design
 - d. To promote unsustainable construction practices
4. A GIS is 'a set of tools for collecting, storing, retrieving at will, transforming, and displaying spatial data from the real world for a particular set of purposes' is a well used definition of a GIS provided by:
 - a. David Rhind (1991)
 - b. Mike Goodchild (1997)
 - c. Peter Burrough (1986)
 - d. Roger Chorley (1987)
5. Plan, Do, Check, and React are part of which of the following?
 - a. Chemical Management System
 - b. Environmental Management System
 - c. Lean Manufacturing
 - d. Greening of the Supply Chain
6. State the number of SDG goals?
 - a. 10
 - b. 12
 - c. 16
 - d. 17
7. Which goal of the 2030 Agenda for Sustainable Development adopted by India in 2015 seeks to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”?
 - a. Goal 2
 - b. Goal 4
 - c. Goal 6
 - d. Goal 14
8. NPSH is a measurement of pressurevapor pressure.
 - a. above
 - b. below
 - c. equal
 - d. negative
9. Shaft power of the motor driving pump is 30kw.The motor efficiency is 0.9 and pump efficiency is 0.6,the power transmitted to the water is...
 - a. 16.2kw
 - b. 18kw

c. 27kw

d. 30kw

10. Enzymes are ..

- a. used to increase the activation energy of reaction
- b. synthetic catalyst

- c. catalysts found in organism
- d. inorganic compound

Part B

Specialisation – Energy

1. Discuss the working mechanism of solar thermal collector with neat schematic diagram.
2. What are the different emissions observed in thermal power station

Specialisation – Environment

1. Since gravity is unlimited, can we use it as an infinite energy source?
2. Explain the working principle of a Concentrated Solar Power (CSP) system.

**School: School of Real Estate & Facilities Management
(SREFM)**

Part A

1. What is the reason for the Global Financial Crisis in 2008?
 - a. Excessive risk taking of banks
 - b. Asset Liability mismatches
 - c. Inter-connected financial system
 - d. All of the above

2. Phillips curve in macro-economics concerns with
 - a. Inflation – Growth trade-off
 - b. Growth – Unemployment trade-off
 - c. Inflation – Unemployment trade-off
 - d. None of the above

3. What tasks do controllers maintain?
 - a. They process the input/output or electrical value
 - b. They will change the flow of the stem to main preset conditions
 - c. Convert the data into an electrical value
 - d. They provide data to a database

4. For comfortable working, the _____ content should be limited to about 0.6% by volume.
 - a. Oxygen
 - b. Hydrogen
 - c. Carbon monoxide
 - d. Carbon dioxide

5. Which of the following methods is used in the Valuation of Residential Properties?
 - a. Sales comparison
 - b. Land and building
 - c. Income method
 - d. All the above

6. Which urban design element can create walkable neighbourhoods and reduce dependence on cars?
 - a. Green Spaces
 - b. Mixed Land Use
 - c. Zoning Regulations
 - d. High Rise Buildings

7. Which option comes closest to explaining 'placemaking'?
 - a. Designing buildings with unique architectural styles
 - b. Implementing strict building design codes
 - c. Creating spaces that supports community's identity and culture
 - d. Building much required infrastructure

8. Remote sensing is a _____ recording of information.
 - a. Contact
 - b. Non - contact
 - c. Both A and B
 - d. None of the above

9. LANDSAT is a satellite series of _____.
- | | |
|-------------------|----------|
| a. Canada | c. USA |
| b. European Union | d. India |
10. Which plan give a perspective picture of a fully developed town.
- | | |
|----------------|----------------------|
| a. Master Plan | c. lay-out plan |
| b. key-plan | d. None of the above |

Specialisation – Real Estate Investment and Finance

1. Define REIT? How is it helping in the growth of Real Estate?

Specialisation - Real Estate and Urban Economics

2. What are the prominent drivers of Real Estate demand in India?

Specialisation - Urban Infrastructure

1. In 2023, approximately a third of the total population in India lived in cities. The trend shows an increase of urbanization by more than 4 percent in the last decade, meaning people have moved away from rural areas to find work and make a living in the cities. This is already putting enormous stress on urban infrastructure in India. What are the few ways in your opinion this challenge of increased urbanization can be tackled?

Note: Discuss at least 3 corrective actions in detail

Specialisation - Building Information Modeling

1. Across the world, BIM (Building Information Modeling) is a crucial and even mandated process to ensure the planning, design, and construction of buildings is highly efficient and collaborative.

How in your opinion, the BIM can be used by the real estate sector for the benefit of all the allied stakeholders?

Note: Discuss in detail at least 3 benefits