# PROVINCIAL MANAGEMENT SERVICE, ETC - 2016

SUBJECT: MATHEMATICS (PAPER-J)

TIME ALLOWED: THREE HOURS

MAXIMUM MARKS: 100

NOTE: Attempt Five Ouestions in Ail. THREE Questions from Section "A"

# SECTION - A

- **Q No. 1**: (a) Evaluate  $\lim_{n \to \infty} \left(1 + \frac{1}{n}\right)^n$ 
  - where n tends to infinity through positive integral values only.

    (b) State and prove Leibniz theorem. Find nth derivative of  $e^{x} \ln x$

(20 Marks)

- Q No. 2: a) Find (i)  $\lim_{x\to 0} (\cot x)^{\sin 2x}$ 
  - (ii)  $\lim_{x \to \frac{\pi}{2} (\frac{\tan x}{\tan 3x})}$
  - b) Evaluate (i)  $\int \frac{dx}{\sqrt{x-x^{\frac{1}{3}}}}$  (ii)  $\int_{-3}^{3} |x| dx$

(20 Marks)

(20 Marks)

- **Q.No. 3**: a) Evaluate  $\int_0^1 \int_0^x (x^2 + 4xy) dy dx$ 
  - b) Evaluate  $\iiint_v 3(x^2 + y^2 + z^2)dv$

Where s is bounded by the planes  $\,x=1$  , x=3 , y=-1 , y=1 z=2 and z=4 ,

Q No. 4: Solve the initial value problems:-

a) 
$$(x^2 + 3y^2)dx - 2xy dy = 0$$
,  $y(2) = 6$ 

b) 
$$(x^2 + 1)\frac{dy}{dx} + 4xy = x$$
,  $y(2) = 1$ 

Q No. 5:

a) A body of mass 2 slugs is dropped with no initial velocity and encounters an air resistance that is proportional to the square of its velocity. Find an expression for the velocity of the body at any time.

(b) Approximate 
$$\int_0^2 \frac{1}{\sqrt{(x^2+1)}} dx$$
 with  $n=4$   
By using rules (i) Trapezoidal (ii) Sampson's

(20 Marks)

# **Mathematics Paper 1 2015 Supplementary**

**Hussin A.Rothana** 

# **Mathematics Paper 1 2015 Supplementary:**

Master Guide for UPTET Paper 1 (Class 1 - 5 teachers) with Past Questions Disha Experts, 2021-08-01 Catalogue of Scientific Papers (1800-1900): Supplementary volume. 1800-1883 Royal Society (Great Britain), 1921 Educart NEET 37 Years Chemistry Solved Papers (PYQs) Chapterwise and Topicwise for NEET 2025 Exam Educart, Dr. Educart NEET 37 Years Physics Solved Papers (PYQs) Chapterwise and Topicwise for Rakshita Singh, 2024-07-25 NEET 2025 Exam Educart, Dr. Rakshita Singh, 2024-07-25 Educart NEET 37 Years Biology Solved Papers (PYOs) Chapterwise and Topicwise for NEET 2025 Exam Educart, Dr. Rakshita Singh, 2024-07-25 ECGBL2015-9th European **Conference on Games Based Learning** Robin Munkvold and Line Kolås, 2015-09-18 These proceedings represent the work of researchers participating in the 9th European Conference on Games Based Learning which is being hosted this year by Nord Trondelag University College Steinkjer Norway on the 8 9 October 2015 The Conference has become a key platform for individuals to present their research findings display their work in progress and discuss conceptual advances in many different areas and specialties within Games Based Learning It also offers the opportunity for like minded individuals to meet discuss and share knowledge ECGBL continues to evolve and develop and the wide range of papers and topics will ensure an interesting two day conference In addition to the main streams of the conference there are mini tracks focusing on the areas of the design of multiplayer collaborative serious games applied Games and gamification the teacher's role in game based learning games for STEM Science Technology Engineering Mathematics learning assessment of digital game based learning and pervasive and ubiquitous gaming for learning In addition to the presentations of research we are delighted to host the third year of the Serious Game competition which provides an opportunity for educational game designers and creators to participate in the conference and demonstrate their game design and development skills in an international competition This competition is again sponsored by SEGAN Serious Games Network With an initial submission of more than 60 games 28 finalists will present their games at the conference Prizes will be awarded to the games judged to demonstrate the best quality and originality of game play itself and the positioning and articulation of the game's contribution to the educational domain With an initial submission of 190 abstracts after the double blind peer review process there are 75 research papers 15 PhD research papers 4 Non Academic papers and 8 work in progress papers published in these Conference Proceedings These papers represent research from more than 40 countries including Australia Austria Belgium Brazil Bulgaria Canada Czech Republic Denmark Finland France Germany Greece Hungary Ireland Israel Italy Japan Malaysia Norway Portugal Russia Saudi Arabia Slovakia Slovenia South Africa Spain Sweden Switzerland Taiwan ROC The Netherlands The Netherlands United Arab Emirates UK and USA Engineering Mechanics 2015 Cyril Fischer, 2016-01-11 Selected peer reviewed papers from the Engineering Mechanics 2015 May 11 14 2015 Svratka Czech Republic **Math Chapterwise** Solved Questions SSC GD CONSTABLE Mocktime Publication, Math Chapterwise Solved Questions SSC GD CONSTABLE

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out the challenging aspects of teacher education for childhood learning which has otherwise been regarded as the softer option for a career in education This book will be of great interest for academics researchers and post graduate students in the fields of teacher education African education educational policy international education and comparative education

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