Indian Institution of Industrial Engineering
National Headquarters, IIIE Bhavan, Plot No.103, Sector - 15
CBD Belapur, Navi Mumbai - 400 614

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Exam Application Form
February 2017

Please read all Instructions
of IIIE Graduateship Examination

Indian Institution of Industrial Engineering

INSTRUCTIONS TO STUDENTS

1. February 2017 Examinations
   a) IIIE Examinations will be held from **2nd to 10th February 2017**.
   b) Last date for receipt of Exam Application - **10/12/2016**
      With late fee of Rs. 800/- **20/12/2016**

2. IIIE Graduateship course Syllabus is revised and is effective from August 2011 exam.

3. **Centre Allotment List** will be hosted on the web site by **1st week of January 2017**. Discrepancy if any, should be reported immediately to Exam Section, IIIE NHQ. Request for any change **will be not be entertained after 15th January 2017.**

4. **Hall Tickets** which are only available through web site and can be downloaded by **20th January 2017.** Students should download the Hall Ticket at their own. **No hard copy of Hall Ticket is prepared by the Institution.**

5. **Students must get their postal address updated immediately by sending email (exam-iiie@iiie-india.com).** Institution will not be responsible for non receipt of mark sheet due to wrong / incomplete address. **Mark Sheet will be sent by Regd. Post only.**

6. The Examination may not be held at a Centre if adequate number of students do not register for the Examination at that Centre. Students are advised to opt for three centres in order of preference from the List of following 25 Centres :

AGRA	CHENNAI	KOCHI	PUNE
AHMEDNAGAR	**DHARWAD** (NEW)	KOLKATA	PONDICHERRY
BARODA	GOA (PONDA)	LUCKNOW	UDAIPUR
BHOPAL	HOSUR	MUMBAI	TRICHY
BANGALORE	HYDERABAD	NEW DELHI	
COIMBATORE	INDORE	NAGPUR	
CHANDIGARH	JAMSHEDPUR	NASHIK	

7. Only student members who have paid the annual subscription are eligible to appear for the Examination. **The application of those who have arrears of subscription or any other dues will be rejected. Annual Subscription fee is Rs. 750/- w.e.f. April 2015.**

8. Examination Fee:

Preliminary Section	per Paper	- Rs.500/-
Section - A	per Paper	- Rs.600/-
Section - B	per Paper	- Rs.700/-
Processing Fee	per application	- Rs.200/-
Old Question paper set	Per Section	- Rs. 250/-

The Examination fee once paid is neither refundable not transferable.

Contd…

9. **Demand Draft / Cheque (multicity) in favour of "Indian Institution of Industrial Engineering", payable at Mumbai. (Cheque will be accepted for the February 2017 Exam only. Penalty will be charged if cheque is dishonoured)**

OR

By NEFT / RTGS transfer as follows :

Indian Institution of Industrial Engineering, State Bank of India, Sector 11, CBD-Belapur, Navi Mumbai, A/c Type: Current Account, A/c No. : 35302782713, IFS Code of the Branch:SBIN0013551 (attach Transaction ID Copy with the Exam Form) and also send email with details of transaction to iiieexamform@gmail.com

10. **Section-B Students are requested to opt newly introduced subject of IEE17 : Elements of Automobile. Engineering in Group IV as Elective Subject. The details of syllabus are given in Page No. 5&6.**

11. **The Student shall submit the Internal Assignment for the subjects, they are appearing for February 2017 exam.**

NOTE : ONLY PAGE NO. 1 & 2 NEED TO BE SENT TO IIIE

IIIE/EXAM/04

Indian Institution of Industrial Engineering

APPLICATION FOR GRADUATESHIP EXAMINATION (Revised Syllabus)

PAGE NO.1

Section (P/A/B) | Month & Year: February 2017 | Membership Number

Student's Name & Address

Mobile No.: & Email ID

Indicate Exam Centre in order of preference **1** **2** **3**

I wish to appear for the following papers marked "✓ " **(Choose only 4 subjects)**. Mark Exempted subjects as **"E"**.

PRELIMINARY

- IE001. Business Communication
- IE002. Elements of Industrial Engineering
- IE003. Mathematics for Engineers
- IE004. Computers & Information Technology
- IE005. Engineering Drawing and Computer Graphics
- IE006. Materials Science

SECTION - A

- IEA01. Probability & Statistical Methods
- IEA02. Operations Research
- IEA03. Financial Accounting and Costing
- IEA04. Principles and Practices of Management
- IEA05. Work Systems Design
- IEA06. Manufacturing Technology
- IEA07. Systems Approach
- IEA08. Economics and Indian Economic Environment

SECTION - B

- IEB01. Facilities Planning and Management
- IEB02. Supply Chain and Logistics Management
- IEB03. Production and Operations Management
- IEB04. Total Quality Management

SECTION-B - ELECTIVE (Any Four)

(Only One Subject from One Group)

GROUP - I

- IEE01. Innovation and Value Engineering
- IEE02. Strategic Management
- IEE03. Advanced Operations Research
- IEE04. Knowledge Management

GROUP - II

- IEE05. Materials Handling
- IEE06. Industrial Automation
- IEE07. Industrial Safety Engineering
- IEE08. Plant Engineering and Maintenance

GROUP - III

- IEE09. Managerial Finance
- IEE10. Total Productivity Management & Business Process Re-Engineering
- IEE11. Business Process Simulation
- IEE12. Entrepreneurship Development

GROUP - IV

- IEE13. Materials Management
- IEE14. Environmental Management
- IEE15. Human Resources Planning and Development
- IEE16. Project Management
- **IEE17. Elements of Automobile Engineering** **(Refer Page No. 5 & 6 for Syllabus)**

Month & Year of Passing (Preliminary/ Section - A)

Exemption Certificate Date

Month, Year and Exam Centre of Previous Examination.

Subjects and Marks obtained in the previous examinations (**Month and Year** of passing should be indicated)

Subject	Marks						Month & Year

Indian Institution of Industrial Engineering

PAGE NO. 2

Membership No. | Section appearing for

Name

E-mail Address **(in legible letters)**

Tel. No. / Cell. No.

Details of Payment in INR

NOTE

1. **Please write the Name, Membership No., & Section in the back side of DD.**
2. **Attach the DD with Page No.2 only.**

Cheque/Demand Draft No.

Online Transaction ID
Bank Name

DD Date.

No.of Subjects

Exam Fee

Processing Fee — Rs. 200/-

Subscription Amount
(Rs.750/- per year -Pay upto 31st May)

Late Fee/
Any other Amount

TOTAL AMOUNT Rs.

Present Address
(For Change of address send email also)

Details of any other Amount

Demand Draft / Cheque (multicity) in favour of "Indian Institution of Industrial Engineering", payable at Mumbai. (Cheque will be accepted for the February 2017 Exam only. Penalty will be charged if cheque is dishonoured)

I have read and understood the instructions.

Date : **Signature of Student**

FOR OFFICE USE ONLY

Receipt No. | Date

Dues for

Remarks

Accountant **Executive Assistant** **Controller of Examinations**

Proposed Elective
Elements of Automobile Engineering

CONTENT

1. Introduction

Classification of automobiles.

Clutch : Details, Requirements of Clutches, Types of Clutches and Clutch materials, Design of clutch, Fluid coupling, Trouble shooting and remedies.

Transmissions : Necessity of gear box, Sliding mesh, Constant mesh, Synchromesh and epicyclic gear box, Overdrives and hydrodynamic torque converter, Trouble shooting and remedies.

Drive line: Propeller shafts and universal joints: Types and construction, Different types of universal joints and constant velocity joints.

Live axle and differential: Final drive, spiral, bevel, Hypoid and worm drives, Types of live axles, semi, three quarter and full floating axles. Necessity of differential, Conventional and non-slip differential, Trouble shooting and remedies.

2. Conventional and non-slip differential, Trouble shooting and remedies.

Brakes: Requirement of brake, Classification of brakes, Mechanical, Hydraulic, Pneumatic, Electro and vaccum brakes. Disc brakes, Braking of front wheel, Rear wheel and four wheel brakes, Brake trouble shooting. Introduction to antilock braking system (ABS).

Steering and Front axles : Steering geometry, Steering requirements, Steering linkages and steering gears, over steer and under steer, Cornering power, Reversibility of steering gears, Types of front axles and their constructions. Trouble shooting and remedies.

3. Suspension:

Objects of suspension, Basic requirements, Springs- Leaf and Coil springs, Air suspension and its features, Independent suspension, Forces acting in independent suspension, Sprung and un-sprung mass, Pitching, rolling and bouncing, Shock absorbers.

Wheels and Tyres: Requirements of wheels and tyres, Constructional features, Types of tyres, Inflation Pressure and its importance, Application to ride and stability, Trouble shooting and remedies.

4. Electrical system:

Battery: Types of battery, Lead-Acid, Alkaline, ZEBRA, Sodium Sulphur and Swing, Ratings, charging, Maintenance and testing of Lead-Acid battery.

Electronic Ignition System: Capacitor Discharge Ignition System, Distributor less ignition System, Direct Ignition system. Hall effect pulse generator, Inductive pulse generator, Constant dwell system, Constant energy system.

Charging System : Dynamo: Principle of operation, Construction, Working, Regulators, combined current and voltage regulator, etc.

Alternator : Principle of operation, Construction, Working, Rectification from AC to DC.

Starting system: Requirements, Various torque terms used, Starter motor drives; Bendix, Follo through, Barrel, Rubber compression, Compression Spring, Friction Clutch, Overrunning Clutch, Dyer. Starter motor solenoids and switches, Glow plugs.

5. Body Engineering:

Importance of Body design, Materials for body construction-Styling forms-Coach and bus body style,
layouts of passenger cars, Bus and truck bodies.
Aerodynamic drag- Aerodynamic lifts and pitching moments, Side force, Yawing moments and rolling moments.
Basic dimensions : Geometrical relations to drivers seat, Dimensions of foot and pedal control, Passenger seats, Vehicle dimensions and visibility.
Overall Criteria for vehicle comparison.
Chassis types and structure types : Open, Semi integral and integral bus structure.
Frames : functions and types of frames, Loads on frames, Load distribution of structure, Location of power plant.

6. Recent trends in Automobiles:

Electronic Control module (ECM), operating modes of ECM (closed loop and open loop) Inputs required and output signals from ECM, Electronic Spark control, Air Management system, Idle speed control. Multipoint fuel injection system and single point fuel injection. Electronic fuel injectors. Principle of operation, Construction, working & application of temperature sensors, inductive sensors, Position sensors (rotary, linear), Pressure sensors, Knock sensors, Hot wire and thin film air flow sensors, vortex flow/turbine fluid sensors, Optical sensor, Oxygen sensors, Light sensors, methanol sensors, Rain sensor, New developments in the sensor technology.

References Books :

1. Automotive Mechanics, Donald L Anglin, William H Crouse, TMH,2006
2. Automotive Mechanics: Principles & Practices : Principles and Practices, Joseph Heitner, CBS Publisher,2004
3. Automobile Engineering, T.R. Banga & Nathu Singh, Khanna Publications,
1993 4. The Automobile,Harbans Singh Reyat,S. Chand Limited,2004
5. Automobile Engineering (Volume -1 & 2),Kirpal Singh,Standard Publishers Distributors,2011 6.
Automobile Electrical and Electronic Systems,Tom Denton,Taylor & Francis,2004
7. Vehicle Body Engineering, J. Pawlowski, Janusz Paw³owski,Business Books, 1969
8. Computerized Engine Controls,Steve V. Hatch, Dick H. King,Thomson/Delmar Learning,
2004 9. Automotive Technology:A Systems Approach,Jack Erjavec,Cengage Learning,2009
10. Light and Heavy Vehicle Technology, M J J Nunney,Taylor & Francis, 2007